

# Crystallographic Space Group Symmetry Tables

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- 

## 1 P1

- Number of Symmetry Operators = 1
- Space Group Name = P1
- Crystal System = TRICLINIC
- Laue Class = -1
- Point Group = 1
- Patterson Space Group # = [2](#)
- Lattice Type = P
- symmetry= X,Y,Z
- asymm=  $0 \leq x \leq 1$  and  $0 \leq y \leq 1$  and  $0 \leq z \leq 1$

## 2 P-1

- Number of Symmetry Operators = 2
- Space Group Name = P-1
- Crystal System = TRICLINIC
- Laue Class = -1
- Point Group = -1
- Patterson Space Group # = [2](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -X,-Y,-Z
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1$  and  $0 \leq z \leq 1$

### 3 P2

- Number of Symmetry Operators = 2
- Space Group Name = P2
- Crystal System = MONOCLINIC
- Laue Class = 2/m
- Point Group = 2
- Patterson Space Group # = [10](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -X,Y,-Z
- asymm=  $0 \leq x \leq 1$  and  $0 \leq y \leq 1$  and  $0 \leq z \leq 1/2$

### 4 P2(1)

- Number of Symmetry Operators = 2
- Space Group Name = P2(1)
- Crystal System = MONOCLINIC
- Laue Class = 2/m
- Point Group = 2
- Patterson Space Group # = [10](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -X,Y+1/2,-Z
- asymm=  $0 \leq x \leq 1$  and  $0 \leq y \leq 1$  and  $0 \leq z \leq 1/2$

### 5 C2

- Number of Symmetry Operators = 4
- Space Group Name = C2
- Crystal System = MONOCLINIC
- Laue Class = 2/m
- Point Group = 2
- Patterson Space Group # = [12](#)
- Lattice Type = C
- symmetry= X,Y,Z
- symmetry= -X,Y,-Z
- symmetry=  $1/2+X, 1/2+Y, Z$
- symmetry=  $1/2-X, 1/2+Y, -Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1$

### 6 Pm

- Number of Symmetry Operators = 2
- Space Group Name = Pm
- Crystal System = MONOCLINIC
- Laue Class = 2/m
- Point Group = m
- Patterson Space Group # = [10](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= X,-Y,Z
- asymm=  $0 \leq x \leq 1$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1$

## 7 Pc

- Number of Symmetry Operators = 2
- Space Group Name = Pc
- Crystal System = MONOCLINIC
- Laue Class = 2/m
- Point Group = m
- Patterson Space Group # = [10](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= X,-Y,1/2+Z
- asymm=  $0 \leq x \leq 1$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1$

## 8 Cm

- Number of Symmetry Operators = 4
- Space Group Name = Cm
- Crystal System = MONOCLINIC
- Laue Class = 2/m
- Point Group = m
- Patterson Space Group # = [12](#)
- Lattice Type = C
- symmetry= X,Y,Z
- symmetry= X,-Y,Z
- symmetry=  $1/2+X, 1/2+Y, Z$
- symmetry=  $1/2+X, 1/2-Y, Z$
- asymm=  $0 \leq x \leq 1$  and  $0 \leq y \leq 1/4$  and  $0 \leq z \leq 1$

## 9 Cc

- Number of Symmetry Operators = 4
- Space Group Name = Cc
- Crystal System = MONOCLINIC
- Laue Class = 2/m
- Point Group = m
- Patterson Space Group # = [12](#)
- Lattice Type = C
- symmetry= X,Y,Z
- symmetry= X,-Y,1/2+Z
- symmetry=  $1/2+X, 1/2+Y, Z$
- symmetry=  $1/2+X, 1/2-Y, 1/2+Z$
- asymm=  $0 \leq x \leq 1$  and  $0 \leq y \leq 1/4$  and  $0 \leq z \leq 1$

## 10 P2/m

- Number of Symmetry Operators = 4
- Space Group Name = P2/m
- Crystal System = MONOCLINIC
- Laue Class = 2/m
- Point Group = 2/m
- Patterson Space Group # = [10](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= X,-Y,Z
- symmetry= -X,Y,-Z

- symmetry=  $-X, -Y, -Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1$

## 11 P2(1)/m

- Number of Symmetry Operators = 4
- Space Group Name = P2(1)/m
- Crystal System = MONOCLINIC
- Laue Class = 2/m
- Point Group = 2/m
- Patterson Space Group # = [10](#)
- Lattice Type = P
- symmetry=  $X, Y, Z$
- symmetry=  $-X, 1/2+Y, -Z$
- symmetry=  $-X, -Y, -Z$
- symmetry=  $X, 1/2-Y, Z$
- asymm=  $0 \leq x \leq 1$  and  $0 \leq y \leq 1/4$  and  $0 \leq z \leq 1$

## 12 C2/m

- Number of Symmetry Operators = 8
- Space Group Name = C2/m
- Crystal System = MONOCLINIC
- Laue Class = 2/m
- Point Group = 2/m
- Patterson Space Group # = [12](#)
- Lattice Type = C
- symmetry=  $X, Y, Z$
- symmetry=  $X, -Y, Z$
- symmetry=  $-X, Y, -Z$
- symmetry=  $-X, -Y, -Z$
- symmetry=  $1/2+X, 1/2+Y, Z$
- symmetry=  $1/2+X, 1/2-Y, Z$
- symmetry=  $1/2-X, 1/2+Y, -Z$
- symmetry=  $1/2-X, 1/2-Y, -Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/4$  and  $0 \leq z \leq 1$

## 13 P2/c

- Number of Symmetry Operators = 4
- Space Group Name = P2/c
- Crystal System = MONOCLINIC
- Laue Class = 2/m
- Point Group = 2/m
- Patterson Space Group # = [10](#)
- Lattice Type = P
- symmetry=  $X, Y, Z$
- symmetry=  $-X, Y, 1/2-Z$
- symmetry=  $-X, -Y, -Z$
- symmetry=  $X, -Y, 1/2+Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1$  and  $0 \leq z \leq 1/2$

## 14 P2(1)/c

- Number of Symmetry Operators = 4



- Space Group Name = P2(1)/c
- Crystal System = MONOCLINIC
- Laue Class = 2/m
- Point Group = 2/m
- Patterson Space Group # = [10](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -X,-Y,-Z
- symmetry= -X,1/2+Y,1/2-Z
- symmetry= X,1/2-Y,1/2+Z
- asymm=  $0 \leq x \leq 1$  and  $0 \leq y \leq 1/4$  and  $0 \leq z \leq 1$

## 15 C2/c

- Number of Symmetry Operators = 8
- Space Group Name = C2/c
- Crystal System = MONOCLINIC
- Laue Class = 2/m
- Point Group = 2/m
- Patterson Space Group # = [12](#)
- Lattice Type = C
- symmetry= X,Y,Z
- symmetry= -X,Y,1/2-Z
- symmetry= -X,-Y,-Z
- symmetry= X,-Y,1/2+Z
- symmetry= 1/2+X,1/2+Y,Z
- symmetry= 1/2-X,1/2+Y,1/2-Z
- symmetry= 1/2-X,1/2-Y,-Z
- symmetry= 1/2+X,1/2-Y,1/2+Z
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$

## 16 P222

- Number of Symmetry Operators = 4
- Space Group Name = P222
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = 222
- Patterson Space Group # = [47](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= -X,Y,-Z
- symmetry= X,-Y,-Z
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1$

## 17 P222(1)

- Number of Symmetry Operators = 4
- Space Group Name = P222(1)
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = 222
- Patterson Space Group # = [47](#)
- Lattice Type = P

- symmetry=  $X,Y,Z$
- symmetry=  $-X,-Y,1/2+Z$
- symmetry=  $-X,Y,1/2-Z$
- symmetry=  $X,-Y,-Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1$

## 1017 P2(1)22

### • non-standard-origin)

- Number of Symmetry Operators = 4
- Space Group Name = P2(1)22
- Crystal System =
- non-standard-origin)
- Laue Class = mmm
- Point Group = 222
- Patterson Space Group # = [47](#)
- Lattice Type = P
- symmetry=  $X,Y,Z$
- symmetry=  $1/2+X,-Y,-Z$
- symmetry=  $1/2-X,-Y,Z$
- symmetry=  $X,Y,-Z$
- asymm=  $0 \leq x \leq 1$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$

## 18 P2(1)2(1)2

- Number of Symmetry Operators = 4
- Space Group Name = P2(1)2(1)2
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = 222
- Patterson Space Group # = [47](#)
- Lattice Type = P
- symmetry=  $X,Y,Z$
- symmetry=  $-X,-Y,Z$
- symmetry=  $1/2-X,1/2+Y,-Z$
- symmetry=  $1/2+X,1/2-Y,-Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1$

## 1018 P2(1)2(1)2

### • non-standard-origin)

- Number of Symmetry Operators = 4
- Space Group Name = P2(1)2(1)2
- Crystal System =
- non-standard-origin)
- Laue Class = mmm
- Point Group = 222
- Patterson Space Group # = [47](#)
- Lattice Type = P
- symmetry=  $X,Y,Z$
- symmetry=  $-X,1/2+Y,-Z$
- symmetry=  $1/2+X,-Y,-Z$
- symmetry=  $1/2-X,1/2-Y,Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1$

## 19 P2(1)2(1)2(1)

- Number of Symmetry Operators = 4
- Space Group Name = P2(1)2(1)2(1)
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = 222
- Patterson Space Group # = [47](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= 1/2-X,-Y,1/2+Z
- symmetry= -X,1/2+Y,1/2-Z
- symmetry= 1/2+X,1/2-Y,-Z
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1$

## 20 C222(1)

- Number of Symmetry Operators = 8
- Space Group Name = C222(1)
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = 222
- Patterson Space Group # = [65](#)
- Lattice Type = C
- symmetry= X,Y,Z
- symmetry= -X,-Y,1/2+Z
- symmetry= -X,Y,1/2-Z
- symmetry= X,-Y,-Z
- symmetry= 1/2+X,1/2+Y,Z
- symmetry= 1/2-X,1/2-Y,1/2+Z
- symmetry= 1/2-X,1/2+Y,1/2-Z
- symmetry= 1/2+X,1/2-Y,-Z
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$

## 21 C222

- Number of Symmetry Operators = 8
- Space Group Name = C222
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = 222
- Patterson Space Group # = [65](#)
- Lattice Type = C
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= -X,Y,-Z
- symmetry= X,-Y,-Z
- symmetry= 1/2+X,1/2+Y,Z
- symmetry= 1/2-X,1/2-Y,Z
- symmetry= 1/2-X,1/2+Y,-Z
- symmetry= 1/2+X,1/2-Y,-Z
- asymm=  $0 \leq x \leq 1/4$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1$

## 22 F222

- Number of Symmetry Operators = 16
- Space Group Name = F222
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = 222
- Patterson Space Group # = [69](#)
- Lattice Type = F
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= -X,Y,-Z
- symmetry= X,-Y,-Z
- symmetry= X,1/2+Y,1/2+Z
- symmetry= -X,1/2-Y,1/2+Z
- symmetry= -X,1/2+Y,1/2-Z
- symmetry= X,1/2-Y,1/2-Z
- symmetry= 1/2+X,Y,1/2+Z
- symmetry= 1/2-X,-Y,1/2+Z
- symmetry= 1/2-X,Y,1/2-Z
- symmetry= 1/2+X,-Y,1/2-Z
- symmetry= 1/2+X,1/2+Y,Z
- symmetry= 1/2-X,1/2-Y,Z
- symmetry= 1/2-X,1/2+Y,-Z
- symmetry= 1/2+X,1/2-Y,-Z
- asymm=  $0 \leq x \leq 1/4$  and  $0 \leq y \leq 1/4$  and  $0 \leq z \leq 1$

## 23 I222

- Number of Symmetry Operators = 8
- Space Group Name = I222
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = 222
- Patterson Space Group # = [71](#)
- Lattice Type = I
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= X,-Y,-Z
- symmetry= -X,Y,-Z
- symmetry= X+1/2,Y+1/2,Z+1/2
- symmetry= -X+1/2,-Y+1/2,Z+1/2
- symmetry= X+1/2,-Y+1/2,-Z+1/2
- symmetry= -X+1/2,Y+1/2,-Z+1/2
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$

## 24 I2(1)2(1)2(1)

- Number of Symmetry Operators = 8
- Space Group Name = I2(1)2(1)2(1)
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = 222
- Patterson Space Group # = [71](#)
- Lattice Type = I
- symmetry= X,Y,Z
- symmetry= 1/2-X,-Y,1/2+Z
- symmetry= -X,1/2+Y,1/2-Z

- symmetry=  $1/2+X, 1/2-Y, -Z$
- symmetry=  $1/2+X, 1/2+Y, 1/2+Z$
- symmetry=  $-X, 1/2-Y, Z$
- symmetry=  $1/2-X, Y, -Z$
- symmetry=  $X, -Y, 1/2-Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$

## 25 Pmm2

- Number of Symmetry Operators = 4
- Space Group Name = Pmm2
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = mm2
- Patterson Space Group # = [47](#)
- Lattice Type = P
- symmetry=  $X, Y, Z$
- symmetry=  $-X, -Y, Z$
- symmetry=  $X, -Y, Z$
- symmetry=  $-X, Y, Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1$

## 26 Pmc2(1)

- Number of Symmetry Operators = 4
- Space Group Name = Pmc2(1)
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = mm2
- Patterson Space Group # = [47](#)
- Lattice Type = P
- symmetry=  $X, Y, Z$
- symmetry=  $-X, -Y, 1/2+Z$
- symmetry=  $X, -Y, 1/2+Z$
- symmetry=  $-X, Y, Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1$

## 27 Pcc2

- Number of Symmetry Operators = 4
- Space Group Name = Pcc2
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = mm2
- Patterson Space Group # = [47](#)
- Lattice Type = P
- symmetry=  $X, Y, Z$
- symmetry=  $-X, -Y, Z$
- symmetry=  $X, -Y, 1/2+Z$
- symmetry=  $-X, Y, 1/2+Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1$

## 28 Pma2

- Number of Symmetry Operators = 4

- Space Group Name = Pma2
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = mm2
- Patterson Space Group # = [47](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= 1/2+X,-Y,Z
- symmetry= 1/2-X,Y,Z
- asymm=  $0 \leq x \leq 1/4$  and  $0 \leq y \leq 1$  and  $0 \leq z \leq 1$

## 29 Pca2(1)

- Number of Symmetry Operators = 4
- Space Group Name = Pca2(1)
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = mm2
- Patterson Space Group # = [47](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -X,-Y,1/2+Z
- symmetry= 1/2+X,-Y,Z
- symmetry= 1/2-X,Y,1/2+Z
- asymm=  $0 \leq x \leq 1/4$  and  $0 \leq y \leq 1$  and  $0 \leq z \leq 1$

## 30 Pnc2

- Number of Symmetry Operators = 4
- Space Group Name = Pnc2
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = mm2
- Patterson Space Group # = [47](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= X,1/2-Y,1/2+Z
- symmetry= -X,1/2+Y,1/2+Z
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1$  and  $0 \leq z \leq 1/2$

## 31 Pmn2(1)

- Number of Symmetry Operators = 4
- Space Group Name = Pmn2(1)
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = mm2
- Patterson Space Group # = [47](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= 1/2-X,-Y,1/2+Z
- symmetry= 1/2+X,-Y,1/2+Z
- symmetry= -X,Y,Z

- $\text{asymm} = 0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1$

## 32 Pba2

- Number of Symmetry Operators = 4
- Space Group Name = Pba2
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = mm2
- Patterson Space Group # = [47](#)
- Lattice Type = P
- symmetry = X,Y,Z
- symmetry = -X,-Y,Z
- symmetry =  $1/2+X, 1/2-Y, Z$
- symmetry =  $1/2-X, 1/2+Y, Z$
- $\text{asymm} = 0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1$

## 33 Pna2(1)

- Number of Symmetry Operators = 4
- Space Group Name = Pna2(1)
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = mm2
- Patterson Space Group # = [47](#)
- Lattice Type = P
- symmetry = X,Y,Z
- symmetry = -X,-Y, $1/2+Z$
- symmetry =  $1/2+X, 1/2-Y, Z$
- symmetry =  $1/2-X, 1/2+Y, 1/2+Z$
- $\text{asymm} = 0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1$

## 34 Pnn2

- Number of Symmetry Operators = 4
- Space Group Name = Pnn2
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = mm2
- Patterson Space Group # = [47](#)
- Lattice Type = P
- symmetry = X,Y,Z
- symmetry = -X,-Y,Z
- symmetry =  $1/2+X, 1/2-Y, 1/2+Z$
- symmetry =  $1/2-X, 1/2+Y, 1/2+Z$
- $\text{asymm} = 0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1$

## 35 Cmm2

- Number of Symmetry Operators = 8
- Space Group Name = Cmm2
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = mm2
- Patterson Space Group # = [65](#)

- Lattice Type = C
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= X,-Y,Z
- symmetry= -X,Y,Z
- symmetry=  $1/2+X, 1/2+Y, Z$
- symmetry=  $1/2-X, 1/2-Y, Z$
- symmetry=  $1/2+X, 1/2-Y, Z$
- symmetry=  $1/2-X, 1/2+Y, Z$
- asymm=  $0 \leq x \leq 1/4$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1$

## 36 Cmc2(1)

- Number of Symmetry Operators = 8
- Space Group Name = Cmc2(1)
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = mm2
- Patterson Space Group # = [65](#)
- Lattice Type = C
- symmetry= X,Y,Z
- symmetry= -X,-Y, $1/2+Z$
- symmetry= X,-Y, $1/2+Z$
- symmetry= -X,Y,Z
- symmetry=  $1/2+X, 1/2+Y, Z$
- symmetry=  $1/2-X, 1/2-Y, 1/2+Z$
- symmetry=  $1/2+X, 1/2-Y, 1/2+Z$
- symmetry=  $1/2-X, 1/2+Y, Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$

## 37 Ccc2

- Number of Symmetry Operators = 8
- Space Group Name = Ccc2
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = mm2
- Patterson Space Group # = [65](#)
- Lattice Type = C
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= X,-Y, $1/2+Z$
- symmetry= -X,Y, $1/2+Z$
- symmetry=  $1/2+X, 1/2+Y, Z$
- symmetry=  $1/2-X, 1/2-Y, Z$
- symmetry=  $1/2+X, 1/2-Y, 1/2+Z$
- symmetry=  $1/2-X, 1/2+Y, 1/2+Z$
- asymm=  $0 \leq x \leq 1/4$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1$

## 38 Amm2

- Number of Symmetry Operators = 8
- Space Group Name = Amm2
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm



- Point Group =  $mm2$
- Patterson Space Group # = [65](#)
- Lattice Type = A
- symmetry= X,Y,Z
- symmetry=  $-X,-Y,Z$
- symmetry= X,-Y,Z
- symmetry=  $-X,Y,Z$
- symmetry=  $X,1/2+Y,1/2+Z$
- symmetry=  $-X,1/2-Y,1/2+Z$
- symmetry=  $X,1/2-Y,1/2+Z$
- symmetry=  $-X,1/2+Y,1/2+Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$

## 39 Abm2

- Number of Symmetry Operators = 8
- Space Group Name = Abm2
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group =  $mm2$
- Patterson Space Group # = [65](#)
- Lattice Type = A
- symmetry= X,Y,Z
- symmetry=  $-X,-Y,Z$
- symmetry=  $X,1/2-Y,Z$
- symmetry=  $-X,1/2+Y,Z$
- symmetry=  $X,1/2+Y,1/2+Z$
- symmetry=  $-X,1/2-Y,1/2+Z$
- symmetry=  $X,-Y,1/2+Z$
- symmetry=  $-X,Y,1/2+Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/4$  and  $0 \leq z \leq 1$

## 40 Ama2

- Number of Symmetry Operators = 8
- Space Group Name = Ama2
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group =  $mm2$
- Patterson Space Group # = [65](#)
- Lattice Type = A
- symmetry= X,Y,Z
- symmetry=  $-X,-Y,Z$
- symmetry=  $1/2+X,-Y,Z$
- symmetry=  $1/2-X,Y,Z$
- symmetry=  $X,1/2+Y,1/2+Z$
- symmetry=  $-X,1/2-Y,1/2+Z$
- symmetry=  $1/2+X,1/2-Y,1/2+Z$
- symmetry=  $1/2-X,1/2+Y,1/2+Z$
- asymm=  $0 \leq x \leq 1/4$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1$

## 41 Aba2

- Number of Symmetry Operators = 8
- Space Group Name = Aba2

- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = mm2
- Patterson Space Group # = [65](#)
- Lattice Type = A
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= 1/2+X,1/2-Y,Z
- symmetry= 1/2-X,1/2+Y,Z
- symmetry= X,1/2+Y,1/2+Z
- symmetry= -X,1/2-Y,1/2+Z
- symmetry= 1/2+X,-Y,1/2+Z
- symmetry= 1/2-X,Y,1/2+Z
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$

## 42 Fmm2

- Number of Symmetry Operators = 16
- Space Group Name = Fmm2
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = mm2
- Patterson Space Group # = [69](#)
- Lattice Type = F
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= X,-Y,Z
- symmetry= -X,Y,Z
- symmetry= X,1/2+Y,1/2+Z
- symmetry= -X,1/2-Y,1/2+Z
- symmetry= X,1/2-Y,1/2+Z
- symmetry= -X,1/2+Y,1/2+Z
- symmetry= 1/2+X,Y,1/2+Z
- symmetry= 1/2-X,-Y,1/2+Z
- symmetry= 1/2+X,-Y,1/2+Z
- symmetry= 1/2-X,Y,1/2+Z
- symmetry= 1/2+X,1/2+Y,Z
- symmetry= 1/2-X,1/2-Y,Z
- symmetry= 1/2+X,1/2-Y,Z
- symmetry= 1/2-X,1/2+Y,Z
- asymm=  $0 \leq x \leq 1/4$  and  $0 \leq y \leq 1/4$  and  $0 \leq z \leq 1$

## 43 Fdd2

- Number of Symmetry Operators = 16
  - Space Group Name = Fdd2
  - Crystal System = ORTHORHOMBIC
  - Laue Class = mmm
  - Point Group = mm2
  - Patterson Space Group # = [69](#)
  - Lattice Type = F
  - symmetry= X,Y,Z
  - symmetry= -X,-Y,Z
  - symmetry= 1/4+X,1/4-Y,1/4+Z
  - symmetry= 1/4-X,1/4+Y,1/4+Z
- {\*!\*}

- symmetry=  $X, 1/2+Y, 1/2+Z$
- symmetry=  $-X, 1/2-Y, 1/2+Z$
- symmetry=  $1/4+X, 3/4-Y, 3/4+Z$
- symmetry=  $1/4-X, 3/4+Y, 3/4+Z$
- symmetry=  $1/2+X, Y, 1/2+Z$
- symmetry=  $1/2-X, -Y, 1/2+Z$
- symmetry=  $3/4+X, 1/4-Y, 3/4+Z$
- symmetry=  $3/4-X, 1/4+Y, 3/4+Z$
- symmetry=  $1/2+X, 1/2+Y, Z$
- symmetry=  $1/2-X, 1/2-Y, Z$
- symmetry=  $3/4+X, 3/4-Y, 1/4+Z$
- symmetry=  $3/4-X, 3/4+Y, 1/4+Z$
- asymm=  $0 \leq x \leq 1/4$  and  $0 \leq y \leq 1/4$  and  $0 \leq z \leq 1$

## 44 Imm2

- Number of Symmetry Operators = 8
- Space Group Name = Imm2
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = mm2
- Patterson Space Group # = [71](#)
- Lattice Type = I
- symmetry=  $X, Y, Z$
- symmetry=  $-X, -Y, Z$
- symmetry=  $X, -Y, Z$
- symmetry=  $-X, Y, Z$
- symmetry=  $1/2+X, 1/2+Y, 1/2+Z$
- symmetry=  $1/2-X, 1/2-Y, 1/2+Z$
- symmetry=  $1/2+X, 1/2-Y, 1/2+Z$
- symmetry=  $1/2-X, 1/2+Y, 1/2+Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$

## 45 Iba2

- Number of Symmetry Operators = 8
- Space Group Name = Iba2
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = mm2
- Patterson Space Group # = [71](#)
- Lattice Type = I
- symmetry=  $X, Y, Z$
- symmetry=  $-X, -Y, Z$
- symmetry=  $1/2+X, 1/2-Y, Z$
- symmetry=  $1/2-X, 1/2+Y, Z$
- symmetry=  $1/2+X, 1/2+Y, 1/2+Z$
- symmetry=  $1/2-X, 1/2-Y, 1/2+Z$
- symmetry=  $X, -Y, 1/2+Z$
- symmetry=  $-X, Y, 1/2+Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$

## 46 Ima2

- Number of Symmetry Operators = 8

- Space Group Name = Ima2
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = mm2
- Patterson Space Group # = [71](#)
- Lattice Type = I
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= 1/2+X,-Y,Z
- symmetry= 1/2-X,Y,Z
- symmetry= 1/2+X,1/2+Y,1/2+Z
- symmetry= 1/2-X,1/2-Y,1/2+Z
- symmetry= X,1/2-Y,1/2+Z
- symmetry= -X,1/2+Y,1/2+Z
- asymm=  $0 \leq x \leq 1/4$  and  $0 \leq y \leq 1$  and  $0 \leq z \leq 1/2$

## 47 Pmmm

- Number of Symmetry Operators = 8
- Space Group Name = Pmmm
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = mmm
- Patterson Space Group # = [47](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= -X,Y,-Z
- symmetry= X,-Y,-Z
- symmetry= -X,-Y,-Z
- symmetry= X,Y,-Z
- symmetry= X,-Y,Z
- symmetry= -X,Y,Z
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$

## 48 Pnnn

- Number of Symmetry Operators = 8
- Space Group Name = Pnnn
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = mmm
- Patterson Space Group # = [47](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= -X,Y,-Z
- symmetry= X,-Y,-Z
- symmetry= 1/2-X,1/2-Y,1/2-Z
- symmetry= 1/2+X,1/2+Y,1/2-Z
- symmetry= 1/2+X,1/2-Y,1/2+Z
- symmetry= 1/2-X,1/2+Y,1/2+Z
- asymm=  $0 \leq x \leq 1/4$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1$

## 49 Pccm

- Number of Symmetry Operators = 8
- Space Group Name = Pccm
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = mmm
- Patterson Space Group # = [47](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= -X,Y,1/2-Z
- symmetry= X,-Y,1/2-Z
- symmetry= -X,-Y,-Z
- symmetry= X,Y,-Z
- symmetry= X,-Y,1/2+Z
- symmetry= -X,Y,1/2+Z
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$

## 50 Pban

- Number of Symmetry Operators = 8
- Space Group Name = Pban
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = mmm
- Patterson Space Group # = [47](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= -X,Y,-Z
- symmetry= X,-Y,-Z
- symmetry= 1/2-X,1/2-Y,-Z
- symmetry= 1/2+X,1/2+Y,-Z
- symmetry= 1/2+X,1/2-Y,Z
- symmetry= 1/2-X,1/2+Y,Z
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$

## 51 Pmma

- Number of Symmetry Operators = 8
- Space Group Name = Pmma
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = mmm
- Patterson Space Group # = [47](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= 1/2-X,-Y,Z
- symmetry= -X,Y,-Z
- symmetry= 1/2+X,-Y,-Z
- symmetry= -X,-Y,-Z
- symmetry= 1/2+X,Y,-Z
- symmetry= X,-Y,Z
- symmetry= 1/2-X,Y,Z
- asymm=  $0 \leq x \leq 1/4$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1$

## 52 Pnna

- Number of Symmetry Operators = 8
- Space Group Name = Pnna
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = mmm
- Patterson Space Group # = [47](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry=  $1/2-X,-Y,Z$
- symmetry=  $1/2-X,1/2+Y,1/2-Z$
- symmetry=  $X,1/2-Y,1/2-Z$
- symmetry=  $-X,-Y,-Z$
- symmetry=  $1/2+X,Y,-Z$
- symmetry=  $1/2+X,1/2-Y,1/2+Z$
- symmetry=  $-X,1/2+Y,1/2+Z$
- asymm=  $0 \leq x \leq 1$  and  $0 \leq y \leq 1/4$  and  $0 \leq z \leq 1/2$

## 53 Pmna

- Number of Symmetry Operators = 8
- Space Group Name = Pmna
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = mmm
- Patterson Space Group # = [47](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry=  $1/2-X,-Y,1/2+Z$
- symmetry=  $1/2-X,Y,1/2-Z$
- symmetry=  $X,-Y,-Z$
- symmetry=  $-X,-Y,-Z$
- symmetry=  $1/2+X,Y,1/2-Z$
- symmetry=  $1/2+X,-Y,1/2+Z$
- symmetry=  $-X,Y,Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1$  and  $0 \leq z \leq 1/4$

## 54 Pcca

- Number of Symmetry Operators = 8
- Space Group Name = Pcca
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = mmm
- Patterson Space Group # = [47](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry=  $1/2-X,-Y,Z$
- symmetry=  $-X,Y,1/2-Z$
- symmetry=  $1/2+X,-Y,1/2-Z$
- symmetry=  $-X,-Y,-Z$
- symmetry=  $1/2+X,Y,-Z$
- symmetry=  $X,-Y,1/2+Z$
- symmetry=  $1/2-X,Y,1/2+Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$

## 55 Pbam

- Number of Symmetry Operators = 8
- Space Group Name = Pbam
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = mmm
- Patterson Space Group # = [47](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= 1/2-X,1/2+Y,-Z
- symmetry= 1/2+X,1/2-Y,-Z
- symmetry= -X,-Y,-Z
- symmetry= X,Y,-Z
- symmetry= 1/2+X,1/2-Y,Z
- symmetry= 1/2-X,1/2+Y,Z
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$

## 56 Pccn

- Number of Symmetry Operators = 8
- Space Group Name = Pccn
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = mmm
- Patterson Space Group # = [47](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= 1/2-X,1/2-Y,Z
- symmetry= -X,1/2+Y,1/2-Z
- symmetry= 1/2+X,-Y,1/2-Z
- symmetry= -X,-Y,-Z
- symmetry= 1/2+X,1/2+Y,-Z
- symmetry= X,1/2-Y,1/2+Z
- symmetry= 1/2-X,Y,1/2+Z
- asymm=  $0 \leq x \leq 1/4$  and  $0 \leq y \leq 1$  and  $0 \leq z \leq 1/2$

## 57 Pbcm

- Number of Symmetry Operators = 8
- Space Group Name = Pbcm
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = mmm
- Patterson Space Group # = [47](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -X,-Y,1/2+Z
- symmetry= -X,1/2+Y,1/2-Z
- symmetry= X,1/2-Y,-Z
- symmetry= -X,-Y,-Z
- symmetry= X,Y,1/2-Z
- symmetry= X,1/2-Y,1/2+Z
- symmetry= -X,1/2+Y,Z
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1$  and  $0 \leq z \leq 1/4$

## 58 Pnnm

- Number of Symmetry Operators = 8
- Space Group Name = Pnnm
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = mmm
- Patterson Space Group # = [47](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= 1/2-X,1/2+Y,1/2-Z
- symmetry= 1/2+X,1/2-Y,1/2-Z
- symmetry= -X,-Y,-Z
- symmetry= X,Y,-Z
- symmetry= 1/2+X,1/2-Y,1/2+Z
- symmetry= 1/2-X,1/2+Y,1/2+Z
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$

## 59 Pmmn

- Number of Symmetry Operators = 8
- Space Group Name = Pmmn
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = mmm
- Patterson Space Group # = [47](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= 1/2-X,Y+1/2,-Z
- symmetry= X+1/2,1/2-Y,-Z
- symmetry= 1/2-X,1/2-Y,-Z
- symmetry= X+1/2,Y+1/2,-Z
- symmetry= X,-Y,Z
- symmetry= -X,Y,Z
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$

## 1059 Pmmn

### • non-standard-origin)

- Number of Symmetry Operators = 8
- Space Group Name = Pmmn
- Crystal System =
- non-standard-origin)
- Laue Class = mmm
- Point Group = mmm
- Patterson Space Group # = [47](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= 1/2-X,1/2-Y,Z
- symmetry= -X,1/2+Y,-Z
- symmetry= 1/2+X,-Y,-Z
- symmetry= -X,-Y,-Z
- symmetry= X+1/2,Y+1/2,-Z
- symmetry= X,1/2-Y,Z
- symmetry= 1/2-X,Y,Z
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$



## 60 Pbcn

- Number of Symmetry Operators = 8
- Space Group Name = Pbcn
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = mmm
- Patterson Space Group # = [47](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry=  $1/2-X, 1/2-Y, 1/2+Z$
- symmetry=  $-X, Y, 1/2-Z$
- symmetry=  $1/2+X, 1/2-Y, -Z$
- symmetry=  $-X, -Y, -Z$
- symmetry=  $1/2+X, 1/2+Y, 1/2-Z$
- symmetry=  $X, -Y, 1/2+Z$
- symmetry=  $1/2-X, 1/2+Y, Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$

## 61 Pbca

- Number of Symmetry Operators = 8
- Space Group Name = Pbca
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = mmm
- Patterson Space Group # = [47](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry=  $1/2-X, -Y, 1/2+Z$
- symmetry=  $-X, 1/2+Y, 1/2-Z$
- symmetry=  $1/2+X, 1/2-Y, -Z$
- symmetry=  $-X, -Y, -Z$
- symmetry=  $1/2+X, Y, 1/2-Z$
- symmetry=  $X, 1/2-Y, 1/2+Z$
- symmetry=  $1/2-X, 1/2+Y, Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$

## 62 Pnma

- Number of Symmetry Operators = 8
- Space Group Name = Pnma
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = mmm
- Patterson Space Group # = [47](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry=  $-X+1/2, -Y, Z+1/2$
- symmetry=  $-X, Y+1/2, -Z$
- symmetry=  $X+1/2, -Y+1/2, -Z+1/2$
- symmetry=  $-X, -Y, -Z$
- symmetry=  $X+1/2, Y, -Z+1/2$
- symmetry=  $X, -Y+1/2, Z$
- symmetry=  $-X+1/2, Y+1/2, Z+1/2$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/4$  and  $0 \leq z \leq 1$

## 63 Cmc<sub>m</sub>

- Number of Symmetry Operators = 16
- Space Group Name = Cmc<sub>m</sub>
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = mmm
- Patterson Space Group # = [65](#)
- Lattice Type = C
- symmetry= X,Y,Z
- symmetry= -X,-Y,1/2+Z
- symmetry= -X,Y,1/2-Z
- symmetry= X,-Y,-Z
- symmetry= -X,-Y,-Z
- symmetry= X,Y,1/2-Z
- symmetry= X,-Y,1/2+Z
- symmetry= -X,Y,Z
- symmetry= 1/2+X,1/2+Y,Z
- symmetry= 1/2-X,1/2-Y,1/2+Z
- symmetry= 1/2-X,1/2+Y,1/2-Z
- symmetry= 1/2+X,1/2-Y,-Z
- symmetry= 1/2-X,1/2-Y,-Z
- symmetry= 1/2+X,1/2+Y,1/2-Z
- symmetry= 1/2+X,1/2-Y,1/2+Z
- symmetry= 1/2-X,1/2+Y,Z
- asymm= 0<=x<=1/2 and 0<=y<=1/2 and 0<=z<=1/4

## 64 Cm<sub>ca</sub>

- Number of Symmetry Operators = 16
- Space Group Name = Cm<sub>ca</sub>
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = mmm
- Patterson Space Group # = [65](#)
- Lattice Type = C
- symmetry= X,Y,Z
- symmetry= -X,1/2-Y,1/2+Z
- symmetry= -X,1/2+Y,1/2-Z
- symmetry= X,-Y,-Z
- symmetry= -X,-Y,-Z
- symmetry= X,1/2+Y,1/2-Z
- symmetry= X,1/2-Y,1/2+Z
- symmetry= -X,Y,Z
- symmetry= 1/2+X,1/2+Y,Z
- symmetry= 1/2-X,-Y,1/2+Z
- symmetry= 1/2-X,Y,1/2-Z
- symmetry= 1/2+X,1/2-Y,-Z
- symmetry= 1/2-X,1/2-Y,-Z
- symmetry= 1/2+X,Y,1/2-Z
- symmetry= 1/2+X,-Y,1/2+Z
- symmetry= 1/2-X,1/2+Y,Z
- asymm= 0<=x<=1/4 and 0<=y<=1/2 and 0<=z<=1/2

## 65 Cmmm

- Number of Symmetry Operators = 16
- Space Group Name = Cmmm
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = mmm
- Patterson Space Group # = [65](#)
- Lattice Type = C
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= -X,Y,-Z
- symmetry= X,-Y,-Z
- symmetry= -X,-Y,-Z
- symmetry= X,Y,-Z
- symmetry= X,-Y,Z
- symmetry= -X,Y,Z
- symmetry=  $1/2+X, 1/2+Y, Z$
- symmetry=  $1/2-X, 1/2-Y, Z$
- symmetry=  $1/2-X, 1/2+Y, -Z$
- symmetry=  $1/2+X, 1/2-Y, -Z$
- symmetry=  $1/2-X, 1/2-Y, -Z$
- symmetry=  $1/2+X, 1/2+Y, -Z$
- symmetry=  $1/2+X, 1/2-Y, Z$
- symmetry=  $1/2-X, 1/2+Y, Z$
- asymm=  $0 \leq x \leq 1/4$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$

## 66 Cccm

- Number of Symmetry Operators = 16
- Space Group Name = Cccm
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = mmm
- Patterson Space Group # = [65](#)
- Lattice Type = C
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= -X,Y,  $1/2-Z$
- symmetry= X,-Y,  $1/2-Z$
- symmetry= -X,-Y,-Z
- symmetry= X,Y,-Z
- symmetry= X,-Y,  $1/2+Z$
- symmetry= -X,Y,  $1/2+Z$
- symmetry=  $1/2+X, 1/2+Y, Z$
- symmetry=  $1/2-X, 1/2-Y, Z$
- symmetry=  $1/2-X, 1/2+Y, 1/2-Z$
- symmetry=  $1/2+X, 1/2-Y, 1/2-Z$
- symmetry=  $1/2-X, 1/2-Y, -Z$
- symmetry=  $1/2+X, 1/2+Y, -Z$
- symmetry=  $1/2+X, 1/2-Y, 1/2+Z$
- symmetry=  $1/2-X, 1/2+Y, 1/2+Z$
- asymm=  $0 \leq x \leq 1/4$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$

## 67 Cmma

- Number of Symmetry Operators = 16
- Space Group Name = Cmma

- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = mmm
- Patterson Space Group # = [65](#)
- Lattice Type = C
- symmetry= X,Y,Z
- symmetry= -X,1/2-Y,Z
- symmetry= -X,1/2+Y,-Z
- symmetry= X,-Y,-Z
- symmetry= -X,-Y,-Z
- symmetry= X,1/2+Y,-Z
- symmetry= X,1/2-Y,Z
- symmetry= -X,Y,Z
- symmetry= 1/2+X,1/2+Y,Z
- symmetry= 1/2-X,-Y,Z
- symmetry= 1/2-X,Y,-Z
- symmetry= 1/2+X,1/2-Y,-Z
- symmetry= 1/2-X,1/2-Y,-Z
- symmetry= 1/2+X,Y,-Z
- symmetry= 1/2+X,-Y,Z
- symmetry= 1/2-X,1/2+Y,Z
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/4$  and  $0 \leq z \leq 1/2$

## 68 Ccca

- Number of Symmetry Operators = 16
- Space Group Name = Ccca
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = mmm
- Patterson Space Group # = [65](#)
- Lattice Type = C
- symmetry= X,Y,Z
- symmetry= 1/2-X,1/2-Y,Z
- symmetry= -X,Y,-Z
- symmetry= 1/2+X,1/2-Y,-Z
- symmetry= -X,1/2-Y,1/2-Z
- symmetry= 1/2+X,Y,1/2-Z
- symmetry= X,1/2-Y,1/2+Z
- symmetry= 1/2-X,Y,1/2+Z
- symmetry= 1/2+X,1/2+Y,Z
- symmetry= -X,-Y,Z
- symmetry= 1/2-X,1/2+Y,-Z
- symmetry= X,-Y,-Z
- symmetry= 1/2-X,-Y,1/2-Z
- symmetry= X,1/2+Y,1/2-Z
- symmetry= 1/2+X,-Y,1/2+Z
- symmetry= -X,1/2+Y,1/2+Z
- asymm=  $0 \leq x \leq 1/4$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$

## 69 Fmmm

- Number of Symmetry Operators = 32
- Space Group Name = Fmmm
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm

- Point Group = mmm
- Patterson Space Group # = [69](#)
- Lattice Type = F
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= -X,Y,-Z
- symmetry= X,-Y,-Z
- symmetry= -X,-Y,-Z
- symmetry= X,Y,-Z
- symmetry= X,-Y,Z
- symmetry= -X,Y,Z
- symmetry= X,1/2+Y,1/2+Z
- symmetry= -X,1/2-Y,1/2+Z
- symmetry= -X,1/2+Y,1/2-Z
- symmetry= X,1/2-Y,1/2-Z
- symmetry= -X,1/2-Y,1/2-Z
- symmetry= X,1/2+Y,1/2-Z
- symmetry= X,1/2-Y,1/2+Z
- symmetry= -X,1/2+Y,1/2+Z
- symmetry= 1/2+X,Y,1/2+Z
- symmetry= 1/2-X,-Y,1/2+Z
- symmetry= 1/2-X,Y,1/2-Z
- symmetry= 1/2+X,-Y,1/2-Z
- symmetry= 1/2-X,-Y,1/2-Z
- symmetry= 1/2+X,Y,1/2-Z
- symmetry= 1/2+X,-Y,1/2+Z
- symmetry= 1/2-X,Y,1/2+Z
- symmetry= 1/2+X,1/2+Y,Z
- symmetry= 1/2-X,1/2-Y,Z
- symmetry= 1/2-X,1/2+Y,-Z
- symmetry= 1/2+X,1/2-Y,-Z
- symmetry= 1/2-X,1/2-Y,-Z
- symmetry= 1/2+X,1/2+Y,-Z
- symmetry= 1/2+X,1/2-Y,Z
- symmetry= 1/2-X,1/2+Y,Z
- asymm=  $0 \leq x \leq 1/4$  and  $0 \leq y \leq 1/4$  and  $0 \leq z \leq 1/2$

## 70 Fddd

- Number of Symmetry Operators = 32
- Space Group Name = Fddd
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = mmm
- Patterson Space Group # = [69](#)
- Lattice Type = F
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= -X,Y,-Z
- symmetry= X,-Y,-Z
- symmetry= 1/4-X,1/4-Y,1/4-Z
- symmetry= 1/4+X,1/4+Y,1/4-Z
- symmetry= 1/4+X,1/4-Y,1/4+Z
- symmetry= 1/4-X,1/4+Y,1/4+Z
- symmetry= X,1/2+Y,1/2+Z
- symmetry= -X,1/2-Y,1/2+Z
- symmetry= -X,1/2+Y,1/2-Z

- symmetry=  $X, 1/2-Y, 1/2-Z$
- symmetry=  $1/4-X, 3/4-Y, 3/4-Z$
- symmetry=  $1/4+X, 3/4+Y, 3/4-Z$
- symmetry=  $1/4+X, 3/4-Y, 3/4+Z$
- symmetry=  $1/4-X, 3/4+Y, 3/4+Z$
- symmetry=  $1/2+X, Y, 1/2+Z$
- symmetry=  $1/2-X, -Y, 1/2+Z$
- symmetry=  $1/2-X, Y, 1/2-Z$
- symmetry=  $1/2+X, -Y, 1/2-Z$
- symmetry=  $3/4-X, 1/4-Y, 3/4-Z$
- symmetry=  $3/4+X, 1/4+Y, 3/4-Z$
- symmetry=  $3/4+X, 1/4-Y, 3/4+Z$
- symmetry=  $3/4-X, 1/4+Y, 3/4+Z$
- symmetry=  $1/2+X, 1/2+Y, Z$
- symmetry=  $1/2-X, 1/2-Y, Z$
- symmetry=  $1/2-X, 1/2+Y, -Z$
- symmetry=  $1/2+X, 1/2-Y, -Z$
- symmetry=  $3/4-X, 3/4-Y, 1/4-Z$
- symmetry=  $3/4+X, 3/4+Y, 1/4-Z$
- symmetry=  $3/4+X, 3/4-Y, 1/4+Z$
- symmetry=  $3/4-X, 3/4+Y, 1/4+Z$
- asymm=  $0 \leq x \leq 1/8$  and  $0 \leq y \leq 1/4$  and  $0 \leq z \leq 1$

## 71 Immm

- Number of Symmetry Operators = 16
- Space Group Name = Immm
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = mmm
- Patterson Space Group # = [71](#)
- Lattice Type = I
- symmetry=  $X, Y, Z$
- symmetry=  $-X, -Y, Z$
- symmetry=  $-X, Y, -Z$
- symmetry=  $X, -Y, -Z$
- symmetry=  $-X, -Y, -Z$
- symmetry=  $X, Y, -Z$
- symmetry=  $X, -Y, Z$
- symmetry=  $-X, Y, Z$
- symmetry=  $1/2+X, 1/2+Y, 1/2+Z$
- symmetry=  $1/2-X, 1/2-Y, 1/2+Z$
- symmetry=  $1/2-X, 1/2+Y, 1/2-Z$
- symmetry=  $1/2+X, 1/2-Y, 1/2-Z$
- symmetry=  $1/2-X, 1/2-Y, 1/2-Z$
- symmetry=  $1/2+X, 1/2+Y, 1/2-Z$
- symmetry=  $1/2+X, 1/2-Y, 1/2+Z$
- symmetry=  $1/2-X, 1/2+Y, 1/2+Z$
- asymm=  $0 \leq x \leq 1/4$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$

## 72 Ibam

- Number of Symmetry Operators = 16
- Space Group Name = Ibam
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm

- Point Group = mmm
- Patterson Space Group # = [71](#)
- Lattice Type = I
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= 1/2-X,1/2+Y,-Z
- symmetry= 1/2+X,1/2-Y,-Z
- symmetry= -X,-Y,-Z
- symmetry= X,Y,-Z
- symmetry= 1/2+X,1/2-Y,Z
- symmetry= 1/2-X,1/2+Y,Z
- symmetry= 1/2+X,1/2+Y,1/2+Z
- symmetry= 1/2-X,1/2-Y,1/2+Z
- symmetry= -X,Y,1/2-Z
- symmetry= X,-Y,1/2-Z
- symmetry= 1/2-X,1/2-Y,1/2-Z
- symmetry= 1/2+X,1/2+Y,1/2-Z
- symmetry= X,-Y,1/2+Z
- symmetry= -X,Y,1/2+Z
- asymm=  $0 \leq x \leq 1/4$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$

## 73 Ibca

- Number of Symmetry Operators = 16
- Space Group Name = Ibca
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = mmm
- Patterson Space Group # = [71](#)
- Lattice Type = I
- symmetry= X,Y,Z
- symmetry= 1/2-X,-Y,1/2+Z
- symmetry= -X,1/2+Y,1/2-Z
- symmetry= 1/2+X,1/2-Y,-Z
- symmetry= -X,-Y,-Z
- symmetry= 1/2+X,Y,1/2-Z
- symmetry= X,1/2-Y,1/2+Z
- symmetry= 1/2-X,1/2+Y,Z
- symmetry= 1/2+X,1/2+Y,1/2+Z
- symmetry= -X,1/2-Y,Z
- symmetry= 1/2-X,Y,-Z
- symmetry= X,-Y,1/2-Z
- symmetry= 1/2-X,1/2-Y,1/2-Z
- symmetry= X,1/2+Y,-Z
- symmetry= 1/2+X,-Y,Z
- symmetry= -X,Y,1/2+Z
- asymm=  $0 \leq x \leq 1/4$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$

## 74 Imma

- Number of Symmetry Operators = 16
- Space Group Name = Imma
- Crystal System = ORTHORHOMBIC
- Laue Class = mmm
- Point Group = mmm
- Patterson Space Group # = [71](#)

- Lattice Type = I
- symmetry= X,Y,Z
- symmetry= -X,1/2-Y,Z
- symmetry= -X,1/2+Y,-Z
- symmetry= X,-Y,-Z
- symmetry= -X,-Y,-Z
- symmetry= X,1/2+Y,-Z
- symmetry= X,1/2-Y,Z
- symmetry= -X,Y,Z
- symmetry= 1/2+X,1/2+Y,1/2+Z
- symmetry= 1/2-X,-Y,1/2+Z
- symmetry= 1/2-X,Y,1/2-Z
- symmetry= 1/2+X,1/2-Y,1/2-Z
- symmetry= 1/2-X,1/2-Y,1/2-Z
- symmetry= 1/2+X,Y,1/2-Z
- symmetry= 1/2+X,-Y,1/2+Z
- symmetry= 1/2-X,1/2+Y,1/2+Z
- asymm=  $0 \leq x \leq 1/4$  and  $0 \leq y \leq 1/4$  and  $0 \leq z \leq 1$

## 75 P4

- Number of Symmetry Operators = 4
- Space Group Name = P4
- Crystal System = TETRAGONAL
- Laue Class = 4/m
- Point Group = 4
- Patterson Space Group # = [83](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= -Y,X,Z
- symmetry= Y,-X,Z
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1$

## 76 P4(1)

- Number of Symmetry Operators = 4
- Space Group Name = P4(1)
- Crystal System = TETRAGONAL
- Laue Class = 4/m
- Point Group = 4
- Patterson Space Group # = [83](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -X,-Y,1/2+Z
- symmetry= -Y,X,1/4+Z
- symmetry= Y,-X,3/4+Z
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1$

## 77 P4(2)

- Number of Symmetry Operators = 4
- Space Group Name = P4(2)
- Crystal System = TETRAGONAL
- Laue Class = 4/m



- Point Group = 4
- Patterson Space Group # = [83](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= -Y,X,1/2+Z
- symmetry= Y,-X,1/2+Z
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1$

## 78 P4(3)

- Number of Symmetry Operators = 4
- Space Group Name = P4(3)
- Crystal System = TETRAGONAL
- Laue Class = 4/m
- Point Group = 4
- Patterson Space Group # = [83](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -X,-Y,1/2+Z
- symmetry= -Y,X,3/4+Z
- symmetry= Y,-X,1/4+Z
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1$

## 79 I4

- Number of Symmetry Operators = 8
- Space Group Name = I4
- Crystal System = TETRAGONAL
- Laue Class = 4/m
- Point Group = 4
- Patterson Space Group # = [87](#)
- Lattice Type = I
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= -Y,X,Z
- symmetry= Y,-X,Z
- symmetry=  $1/2+X, 1/2+Y, 1/2+Z$
- symmetry=  $1/2-X, 1/2-Y, 1/2+Z$
- symmetry=  $1/2-Y, 1/2+X, 1/2+Z$
- symmetry=  $1/2+Y, 1/2-X, 1/2+Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$

## 80 I4(1)

- Number of Symmetry Operators = 8
- Space Group Name = I4(1)
- Crystal System = TETRAGONAL
- Laue Class = 4/m
- Point Group = 4
- Patterson Space Group # = [87](#)
- Lattice Type = I
- symmetry= X,Y,Z
- symmetry=  $1/2-X, 1/2-Y, 1/2+Z$
- symmetry=  $-Y, 1/2+X, 1/4+Z$

- symmetry=  $1/2+Y, -X, 3/4+Z$
- symmetry=  $1/2+X, 1/2+Y, 1/2+Z$
- symmetry=  $-X, -Y, Z$
- symmetry=  $1/2-Y, X, 3/4+Z$
- symmetry=  $Y, 1/2-X, 1/4+Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1$  and  $0 \leq z \leq 1/4$

## 81 P-4

- Number of Symmetry Operators = 4
- Space Group Name = P-4
- Crystal System = TETRAGONAL
- Laue Class = 4/m
- Point Group = -4
- Patterson Space Group # = [83](#)
- Lattice Type = P
- symmetry=  $X, Y, Z$
- symmetry=  $-X, -Y, Z$
- symmetry=  $Y, -X, -Z$
- symmetry=  $-Y, X, -Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1$

## 82 I-4

- Number of Symmetry Operators = 8
- Space Group Name = I-4
- Crystal System = TETRAGONAL
- Laue Class = 4/m
- Point Group = -4
- Patterson Space Group # = [87](#)
- Lattice Type = I
- symmetry=  $X, Y, Z$
- symmetry=  $-X, -Y, Z$
- symmetry=  $Y, -X, -Z$
- symmetry=  $-Y, X, -Z$
- symmetry=  $1/2+X, 1/2+Y, 1/2+Z$
- symmetry=  $1/2-X, 1/2-Y, 1/2+Z$
- symmetry=  $1/2+Y, 1/2-X, 1/2-Z$
- symmetry=  $1/2-Y, 1/2+X, 1/2-Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$

## 83 P4/m

- Number of Symmetry Operators = 8
- Space Group Name = P4/m
- Crystal System = TETRAGONAL
- Laue Class = 4/m
- Point Group = 4/m
- Patterson Space Group # = [83](#)
- Lattice Type = P
- symmetry=  $X, Y, Z$
- symmetry=  $-X, -Y, Z$
- symmetry=  $-Y, X, Z$
- symmetry=  $Y, -X, Z$
- symmetry=  $-X, -Y, -Z$

- symmetry= X,Y,-Z
- symmetry= Y,-X,-Z
- symmetry= -Y,X,-Z
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$

## 84 P4(2)/m

- Number of Symmetry Operators = 8
- Space Group Name = P4(2)/m
- Crystal System = TETRAGONAL
- Laue Class = 4/m
- Point Group = 4/m
- Patterson Space Group # = [83](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= -Y,X,1/2+Z
- symmetry= Y,-X,1/2+Z
- symmetry= -X,-Y,-Z
- symmetry= X,Y,-Z
- symmetry= Y,-X,1/2-Z
- symmetry= -Y,X,1/2-Z
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$

## 85 P4/n

- Number of Symmetry Operators = 8
- Space Group Name = P4/n
- Crystal System = TETRAGONAL
- Laue Class = 4/m
- Point Group = 4/m
- Patterson Space Group # = [83](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= 1/2-Y,1/2+X,Z
- symmetry= 1/2+Y,1/2-X,Z
- symmetry= 1/2-X,1/2-Y,-Z
- symmetry= 1/2+X,1/2+Y,-Z
- symmetry= Y,-X,-Z
- symmetry= -Y,X,-Z
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$

## 86 P4(2)/n

- Number of Symmetry Operators = 8
- Space Group Name = P4(2)/n
- Crystal System = TETRAGONAL
- Laue Class = 4/m
- Point Group = 4/m
- Patterson Space Group # = [83](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= 1/2-Y,1/2+X,1/2+Z

- symmetry=  $1/2+Y, 1/2-X, 1/2+Z$
- symmetry=  $1/2-X, 1/2-Y, 1/2-Z$
- symmetry=  $1/2+X, 1/2+Y, 1/2-Z$
- symmetry=  $Y, -X, -Z$
- symmetry=  $-Y, X, -Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1$  and  $0 \leq z \leq 1/4$

## 87 I4/m

- Number of Symmetry Operators = 16
- Space Group Name = I4/m
- Crystal System = TETRAGONAL
- Laue Class = 4/m
- Point Group = 4/m
- Patterson Space Group # = [87](#)
- Lattice Type = I
- symmetry=  $X, Y, Z$
- symmetry=  $-X, -Y, Z$
- symmetry=  $-Y, X, Z$
- symmetry=  $Y, -X, Z$
- symmetry=  $-X, -Y, -Z$
- symmetry=  $X, Y, -Z$
- symmetry=  $Y, -X, -Z$
- symmetry=  $-Y, X, -Z$
- symmetry=  $1/2+X, 1/2+Y, 1/2+Z$
- symmetry=  $1/2-X, 1/2-Y, 1/2+Z$
- symmetry=  $1/2-Y, 1/2+X, 1/2+Z$
- symmetry=  $1/2+Y, 1/2-X, 1/2+Z$
- symmetry=  $1/2-X, 1/2-Y, 1/2-Z$
- symmetry=  $1/2+X, 1/2+Y, 1/2-Z$
- symmetry=  $1/2+Y, 1/2-X, 1/2-Z$
- symmetry=  $1/2-Y, 1/2+X, 1/2-Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/4$

## 88 I4(1)/a

- Number of Symmetry Operators = 16
- Space Group Name = I4(1)/a
- Crystal System = TETRAGONAL
- Laue Class = 4/m
- Point Group = 4/m
- Patterson Space Group # = [87](#)
- Lattice Type = I
- symmetry=  $X, Y, Z$
- symmetry=  $1/2-X, 1/2-Y, 1/2+Z$
- symmetry=  $-Y, 1/2+X, 1/4+Z$
- symmetry=  $1/2+Y, -X, 3/4+Z$
- symmetry=  $-X, 1/2-Y, 1/4-Z$
- symmetry=  $1/2+X, Y, 3/4-Z$
- symmetry=  $Y, -X, -Z$
- symmetry=  $1/2-Y, 1/2+X, 1/2-Z$
- symmetry=  $1/2+X, 1/2+Y, 1/2+Z$
- symmetry=  $-X, -Y, Z$
- symmetry=  $1/2-Y, X, 3/4+Z$
- symmetry=  $Y, 1/2-X, 1/4+Z$
- symmetry=  $1/2-X, -Y, 3/4-Z$

- symmetry=  $X, 1/2+Y, 1/4-Z$
- symmetry=  $1/2+Y, 1/2-X, 1/2-Z$
- symmetry=  $-Y, X, -Z$
- asymm=  $0 \leq x \leq 1/4$  and  $0 \leq y \leq 1/4$  and  $0 \leq z \leq 1$

## 89 P422

- Number of Symmetry Operators = 8
- Space Group Name = P422
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = 422
- Patterson Space Group # = [123](#)
- Lattice Type = P
- symmetry=  $X, Y, Z$
- symmetry=  $-X, -Y, Z$
- symmetry=  $-Y, X, Z$
- symmetry=  $Y, -X, Z$
- symmetry=  $-X, Y, -Z$
- symmetry=  $X, -Y, -Z$
- symmetry=  $Y, X, -Z$
- symmetry=  $-Y, -X, -Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$

## 90 P42(1)2

- Number of Symmetry Operators = 8
- Space Group Name = P42(1)2
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = 422
- Patterson Space Group # = [123](#)
- Lattice Type = P
- symmetry=  $X, Y, Z$
- symmetry=  $-X, -Y, Z$
- symmetry=  $1/2-Y, 1/2+X, Z$
- symmetry=  $1/2+Y, 1/2-X, Z$
- symmetry=  $1/2-X, 1/2+Y, -Z$
- symmetry=  $1/2+X, 1/2-Y, -Z$
- symmetry=  $Y, X, -Z$
- symmetry=  $-Y, -X, -Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$

## 91 P4(1)22

- Number of Symmetry Operators = 8
- Space Group Name = P4(1)22
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = 422
- Patterson Space Group # = [123](#)
- Lattice Type = P
- symmetry=  $X, Y, Z$
- symmetry=  $-X, -Y, 1/2+Z$
- symmetry=  $-Y, X, 1/4+Z$

- symmetry=  $Y, -X, 3/4+Z$
- symmetry=  $-X, Y, -Z$
- symmetry=  $X, -Y, 1/2-Z$
- symmetry=  $Y, X, 3/4-Z$
- symmetry=  $-Y, -X, 1/4-Z$
- asymm=  $0 \leq x \leq 1$  and  $0 \leq y \leq 1$  and  $0 \leq z \leq 1/8$

## 92 P4(1)2(1)2

- Number of Symmetry Operators = 8
- Space Group Name = P4(1)2(1)2
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = 422
- Patterson Space Group # = [123](#)
- Lattice Type = P
- symmetry=  $X, Y, Z$
- symmetry=  $-X, -Y, 1/2+Z$
- symmetry=  $1/2-Y, 1/2+X, 1/4+Z$
- symmetry=  $1/2+Y, 1/2-X, 3/4+Z$
- symmetry=  $1/2-X, 1/2+Y, 1/4-Z$
- symmetry=  $1/2+X, 1/2-Y, 3/4-Z$
- symmetry=  $Y, X, -Z$
- symmetry=  $-Y, -X, 1/2-Z$
- asymm=  $0 \leq x \leq 1$  and  $0 \leq y \leq 1$  and  $0 \leq z \leq 1/8$

## 93 P4(2)22

- Number of Symmetry Operators = 8
- Space Group Name = P4(2)22
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = 422
- Patterson Space Group # = [123](#)
- Lattice Type = P
- symmetry=  $X, Y, Z$
- symmetry=  $-X, -Y, Z$
- symmetry=  $-Y, X, 1/2+Z$
- symmetry=  $Y, -X, 1/2+Z$
- symmetry=  $-X, Y, -Z$
- symmetry=  $X, -Y, -Z$
- symmetry=  $Y, X, 1/2-Z$
- symmetry=  $-Y, -X, 1/2-Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1$  and  $0 \leq z \leq 1/4$

## 94 P4(2)2(1)2

- Number of Symmetry Operators = 8
- Space Group Name = P4(2)2(1)2
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = 422
- Patterson Space Group # = [123](#)
- Lattice Type = P
- symmetry=  $X, Y, Z$

- symmetry=  $-X, -Y, Z$
- symmetry=  $1/2 - Y, 1/2 + X, 1/2 + Z$
- symmetry=  $1/2 + Y, 1/2 - X, 1/2 + Z$
- symmetry=  $1/2 - X, 1/2 + Y, 1/2 - Z$
- symmetry=  $1/2 + X, 1/2 - Y, 1/2 - Z$
- symmetry=  $Y, X, -Z$
- symmetry=  $-Y, -X, -Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$

## 95 P4(3)22

- Number of Symmetry Operators = 8
- Space Group Name = P4(3)22
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = 422
- Patterson Space Group # = [123](#)
- Lattice Type = P
- symmetry=  $X, Y, Z$
- symmetry=  $-X, -Y, 1/2 + Z$
- symmetry=  $-Y, X, 3/4 + Z$
- symmetry=  $Y, -X, 1/4 + Z$
- symmetry=  $-X, Y, -Z$
- symmetry=  $X, -Y, 1/2 - Z$
- symmetry=  $Y, X, 1/4 - Z$
- symmetry=  $-Y, -X, 3/4 - Z$
- asymm=  $0 \leq x \leq 1$  and  $0 \leq y \leq 1$  and  $0 \leq z \leq 1/8$

## 96 P4(3)2(1)2

- Number of Symmetry Operators = 8
- Space Group Name = P4(3)2(1)2
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = 422
- Patterson Space Group # = [123](#)
- Lattice Type = P
- symmetry=  $X, Y, Z$
- symmetry=  $-X, -Y, 1/2 + Z$
- symmetry=  $1/2 - Y, 1/2 + X, 3/4 + Z$
- symmetry=  $1/2 + Y, 1/2 - X, 1/4 + Z$
- symmetry=  $1/2 - X, 1/2 + Y, 3/4 - Z$
- symmetry=  $1/2 + X, 1/2 - Y, 1/4 - Z$
- symmetry=  $Y, X, -Z$
- symmetry=  $-Y, -X, 1/2 - Z$
- asymm=  $0 \leq x \leq 1$  and  $0 \leq y \leq 1$  and  $0 \leq z \leq 1/8$

## 97 I422

- Number of Symmetry Operators = 16
- Space Group Name = I422
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = 422
- Patterson Space Group # = [139](#)

- Lattice Type = I
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= -Y,X,Z
- symmetry= Y,-X,Z
- symmetry= -X,Y,-Z
- symmetry= X,-Y,-Z
- symmetry= Y,X,-Z
- symmetry= -Y,-X,-Z
- symmetry=  $1/2+X, 1/2+Y, 1/2+Z$
- symmetry=  $1/2-X, 1/2-Y, 1/2+Z$
- symmetry=  $1/2-Y, 1/2+X, 1/2+Z$
- symmetry=  $1/2+Y, 1/2-X, 1/2+Z$
- symmetry=  $1/2-X, 1/2+Y, 1/2-Z$
- symmetry=  $1/2+X, 1/2-Y, 1/2-Z$
- symmetry=  $1/2+Y, 1/2+X, 1/2-Z$
- symmetry=  $1/2-Y, 1/2-X, 1/2-Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/4$

## 98 I4(1)22

- Number of Symmetry Operators = 16
- Space Group Name = I4(1)22
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = 422
- Patterson Space Group # = [139](#)
- Lattice Type = I
- symmetry= X,Y,Z
- symmetry=  $1/2-X, 1/2-Y, 1/2+Z$
- symmetry= -Y,  $1/2+X, 1/4+Z$
- symmetry=  $1/2+Y, -X, 3/4+Z$
- symmetry=  $1/2-X, Y, 3/4-Z$
- symmetry= X,  $1/2-Y, 1/4-Z$
- symmetry=  $1/2+Y, 1/2+X, 1/2-Z$
- symmetry= -Y,-X,-Z
- symmetry=  $1/2+X, 1/2+Y, 1/2+Z$
- symmetry= -X,-Y,Z
- symmetry=  $1/2-Y, X, 3/4+Z$
- symmetry= Y,  $1/2-X, 1/4+Z$
- symmetry= -X,  $1/2+Y, 1/4-Z$
- symmetry=  $1/2+X, -Y, 3/4-Z$
- symmetry= Y,X,-Z
- symmetry=  $1/2-Y, 1/2-X, 1/2-Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1$  and  $0 \leq z \leq 1/8$

## 99 P4mm

- Number of Symmetry Operators = 8
- Space Group Name = P4mm
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = 4mm
- Patterson Space Group # = [123](#)
- Lattice Type = P
- symmetry= X,Y,Z



- symmetry=  $-X,-Y,Z$
- symmetry=  $-Y,X,Z$
- symmetry=  $Y,-X,Z$
- symmetry=  $X,-Y,Z$
- symmetry=  $-X,Y,Z$
- symmetry=  $-Y,-X,Z$
- symmetry=  $Y,X,Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1$  and  $x \leq y$

## 100 P4bm

- Number of Symmetry Operators = 8
- Space Group Name = P4bm
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = 4mm
- Patterson Space Group # = [123](#)
- Lattice Type = P
- symmetry=  $X,Y,Z$
- symmetry=  $-X,-Y,Z$
- symmetry=  $-Y,X,Z$
- symmetry=  $Y,-X,Z$
- symmetry=  $1/2+X,1/2-Y,Z$
- symmetry=  $1/2-X,1/2+Y,Z$
- symmetry=  $1/2-Y,1/2-X,Z$
- symmetry=  $1/2+Y,1/2+X,Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1$  and  $y \leq 1/2-x$

## 101 P4(2)cm

- Number of Symmetry Operators = 8
- Space Group Name = P4(2)cm
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = 4mm
- Patterson Space Group # = [123](#)
- Lattice Type = P
- symmetry=  $X,Y,Z$
- symmetry=  $-X,-Y,Z$
- symmetry=  $-Y,X,1/2+Z$
- symmetry=  $Y,-X,1/2+Z$
- symmetry=  $X,-Y,1/2+Z$
- symmetry=  $-X,Y,1/2+Z$
- symmetry=  $-Y,-X,Z$
- symmetry=  $Y,X,Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1$  and  $x \leq y$

## 102 P4(2)nm

- Number of Symmetry Operators = 8
- Space Group Name = P4(2)nm
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = 4mm
- Patterson Space Group # = [123](#)

- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry=  $1/2-Y, 1/2+X, 1/2+Z$
- symmetry=  $1/2+Y, 1/2-X, 1/2+Z$
- symmetry=  $1/2+X, 1/2-Y, 1/2+Z$
- symmetry=  $1/2-X, 1/2+Y, 1/2+Z$
- symmetry= -Y,-X,Z
- symmetry= Y,X,Z
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1$  and  $x \leq y$

## 103 P4cc

- Number of Symmetry Operators = 8
- Space Group Name = P4cc
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = 4mm
- Patterson Space Group # = [123](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= -Y,X,Z
- symmetry= Y,-X,Z
- symmetry=  $X, -Y, 1/2+Z$
- symmetry=  $-X, Y, 1/2+Z$
- symmetry=  $-Y, -X, 1/2+Z$
- symmetry=  $Y, X, 1/2+Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$

## 104 P4nc

- Number of Symmetry Operators = 8
- Space Group Name = P4nc
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = 4mm
- Patterson Space Group # = [123](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= -Y,X,Z
- symmetry= Y,-X,Z
- symmetry=  $1/2+X, 1/2-Y, 1/2+Z$
- symmetry=  $1/2-X, 1/2+Y, 1/2+Z$
- symmetry=  $1/2-Y, 1/2-X, 1/2+Z$
- symmetry=  $1/2+Y, 1/2+X, 1/2+Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$

## 105 P4(2)mc

- Number of Symmetry Operators = 8
- Space Group Name = P4(2)mc
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm

- Point Group = 4mm
- Patterson Space Group # = [123](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= -Y,X,1/2+Z
- symmetry= Y,-X,1/2+Z
- symmetry= X,-Y,Z
- symmetry= -X,Y,Z
- symmetry= -Y,-X,1/2+Z
- symmetry= Y,X,1/2+Z
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$

## 106 P4(2)bc

- Number of Symmetry Operators = 8
- Space Group Name = P4(2)bc
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = 4mm
- Patterson Space Group # = [123](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= -Y,X,1/2+Z
- symmetry= Y,-X,1/2+Z
- symmetry= 1/2+X,1/2-Y,Z
- symmetry= 1/2-X,1/2+Y,Z
- symmetry= 1/2-Y,1/2-X,1/2+Z
- symmetry= 1/2+Y,1/2+X,1/2+Z
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$

## 107 I4mm

- Number of Symmetry Operators = 16
- Space Group Name = I4mm
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = 4mm
- Patterson Space Group # = [139](#)
- Lattice Type = I
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= -Y,X,Z
- symmetry= Y,-X,Z
- symmetry= X,-Y,Z
- symmetry= -X,Y,Z
- symmetry= -Y,-X,Z
- symmetry= Y,X,Z
- symmetry= 1/2+X,1/2+Y,1/2+Z
- symmetry= 1/2-X,1/2-Y,1/2+Z
- symmetry= 1/2-Y,1/2+X,1/2+Z
- symmetry= 1/2+Y,1/2-X,1/2+Z
- symmetry= 1/2+X,1/2-Y,1/2+Z
- symmetry= 1/2-X,1/2+Y,1/2+Z
- symmetry= 1/2-Y,1/2-X,1/2+Z

- symmetry=  $1/2+Y, 1/2+X, 1/2+Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$  and  $x \leq y$

## 108 I4cm

- Number of Symmetry Operators = 16
- Space Group Name = I4cm
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = 4mm
- Patterson Space Group # = [139](#)
- Lattice Type = I
- symmetry=  $X, Y, Z$
- symmetry=  $-X, -Y, Z$
- symmetry=  $-Y, X, Z$
- symmetry=  $Y, -X, Z$
- symmetry=  $X, -Y, 1/2+Z$
- symmetry=  $-X, Y, 1/2+Z$
- symmetry=  $-Y, -X, 1/2+Z$
- symmetry=  $Y, X, 1/2+Z$
- symmetry=  $1/2+X, 1/2+Y, 1/2+Z$
- symmetry=  $1/2-X, 1/2-Y, 1/2+Z$
- symmetry=  $1/2-Y, 1/2+X, 1/2+Z$
- symmetry=  $1/2+Y, 1/2-X, 1/2+Z$
- symmetry=  $1/2+X, 1/2-Y, Z$
- symmetry=  $1/2-X, 1/2+Y, Z$
- symmetry=  $1/2-Y, 1/2-X, Z$
- symmetry=  $1/2+Y, 1/2+X, Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$  and  $y \leq 1/2-x$

## 109 I4(1)md

- Number of Symmetry Operators = 16
- Space Group Name = I4(1)md
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = 4mm
- Patterson Space Group # = [139](#)
- Lattice Type = I
- symmetry=  $X, Y, Z$
- symmetry=  $1/2-X, 1/2-Y, 1/2+Z$
- symmetry=  $-Y, 1/2+X, 1/4+Z$
- symmetry=  $1/2+Y, -X, 3/4+Z$
- symmetry=  $X, -Y, Z$
- symmetry=  $1/2-X, 1/2+Y, 1/2+Z$
- symmetry=  $-Y, 1/2-X, 1/4+Z$
- symmetry=  $1/2+Y, X, 3/4+Z$
- symmetry=  $1/2+X, 1/2+Y, 1/2+Z$
- symmetry=  $-X, -Y, Z$
- symmetry=  $1/2-Y, X, 3/4+Z$
- symmetry=  $Y, 1/2-X, 1/4+Z$
- symmetry=  $1/2+X, 1/2-Y, 1/2+Z$
- symmetry=  $-X, Y, Z$
- symmetry=  $1/2-Y, -X, 3/4+Z$
- symmetry=  $Y, 1/2+X, 1/4+Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/4$

## 110 I4(1)cd

- Number of Symmetry Operators = 16
- Space Group Name = I4(1)cd
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = 4mm
- Patterson Space Group # = [139](#)
- Lattice Type = I
- symmetry= X,Y,Z
- symmetry=  $1/2-X, 1/2-Y, 1/2+Z$
- symmetry=  $-Y, 1/2+X, 1/4+Z$
- symmetry=  $1/2+Y, -X, 3/4+Z$
- symmetry=  $X, -Y, 1/2+Z$
- symmetry=  $1/2-X, 1/2+Y, Z$
- symmetry=  $-Y, 1/2-X, 3/4+Z$
- symmetry=  $1/2+Y, X, 1/4+Z$
- symmetry=  $1/2+X, 1/2+Y, 1/2+Z$
- symmetry=  $-X, -Y, Z$
- symmetry=  $1/2-Y, X, 3/4+Z$
- symmetry=  $Y, 1/2-X, 1/4+Z$
- symmetry=  $1/2+X, 1/2-Y, Z$
- symmetry=  $-X, Y, 1/2+Z$
- symmetry=  $1/2-Y, -X, 1/4+Z$
- symmetry=  $Y, 1/2+X, 3/4+Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/4$

## 111 P-42m

- Number of Symmetry Operators = 8
- Space Group Name = P-42m
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = -42m
- Patterson Space Group # = [123](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry=  $-X, -Y, Z$
- symmetry=  $-Y, X, -Z$
- symmetry=  $Y, -X, -Z$
- symmetry=  $-X, Y, -Z$
- symmetry=  $X, -Y, -Z$
- symmetry=  $-Y, -X, Z$
- symmetry= Y,X,Z
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1$  and  $x \leq y$

## 112 P-42c

- Number of Symmetry Operators = 8
- Space Group Name = P-42c
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = -42m
- Patterson Space Group # = [123](#)
- Lattice Type = P
- symmetry= X,Y,Z

- symmetry=  $-X, -Y, Z$
- symmetry=  $-Y, X, -Z$
- symmetry=  $Y, -X, -Z$
- symmetry=  $-X, Y, 1/2-Z$
- symmetry=  $X, -Y, 1/2-Z$
- symmetry=  $-Y, -X, 1/2+Z$
- symmetry=  $Y, X, 1/2+Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$

## 113 P-42(1)m

- Number of Symmetry Operators = 8
- Space Group Name = P-42(1)m
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = -42m
- Patterson Space Group # = [123](#)
- Lattice Type = P
- symmetry=  $X, Y, Z$
- symmetry=  $-X, -Y, Z$
- symmetry=  $-Y, X, -Z$
- symmetry=  $Y, -X, -Z$
- symmetry=  $1/2-X, 1/2+Y, -Z$
- symmetry=  $1/2+X, 1/2-Y, -Z$
- symmetry=  $1/2-Y, 1/2-X, Z$
- symmetry=  $1/2+Y, 1/2+X, Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1$  and  $y \leq 1/2-x$

## 114 P-42(1)c

- Number of Symmetry Operators = 8
- Space Group Name = P-42(1)c
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = -42m
- Patterson Space Group # = [123](#)
- Lattice Type = P
- symmetry=  $X, Y, Z$
- symmetry=  $-X, -Y, Z$
- symmetry=  $-Y, X, -Z$
- symmetry=  $Y, -X, -Z$
- symmetry=  $1/2-X, 1/2+Y, 1/2-Z$
- symmetry=  $1/2+X, 1/2-Y, 1/2-Z$
- symmetry=  $1/2-Y, 1/2-X, 1/2+Z$
- symmetry=  $1/2+Y, 1/2+X, 1/2+Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$

## 115 P-4m2

- Number of Symmetry Operators = 8
- Space Group Name = P-4m2
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = -42m
- Patterson Space Group # = [123](#)

- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= Y,-X,-Z
- {\*\*}
- symmetry= -Y,X,-Z
- {\*\*}
- symmetry= X,-Y,Z
- {\*\*}
- symmetry= -X,Y,Z
- symmetry= Y,X,-Z
- symmetry= -Y,-X,-Z
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$

## 116 P-4c2

- Number of Symmetry Operators = 8
- Space Group Name = P-4c2
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = -42m
- Patterson Space Group # = [123](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= -Y,X,-Z
- symmetry= Y,-X,-Z
- symmetry= X,-Y,1/2+Z
- symmetry= -X,Y,1/2+Z
- symmetry= Y,X,1/2-Z
- symmetry= -Y,-X,1/2-Z
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1$  and  $0 \leq z \leq 1/4$

## 117 P-4b2

- Number of Symmetry Operators = 8
- Space Group Name = P-4b2
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = -42m
- Patterson Space Group # = [123](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= -Y,X,-Z
- symmetry= Y,-X,-Z
- symmetry= 1/2+X,1/2-Y,Z
- symmetry= 1/2-X,1/2+Y,Z
- symmetry= 1/2+Y,1/2+X,-Z
- symmetry= 1/2-Y,1/2-X,-Z
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$

## 118 P-4n2

- Number of Symmetry Operators = 8

- Space Group Name = P-4n2
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = -42m
- Patterson Space Group # = [123](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= -Y,X,-Z
- symmetry= Y,-X,-Z
- symmetry= 1/2+X,1/2-Y,1/2+Z
- symmetry= 1/2-X,1/2+Y,1/2+Z
- symmetry= 1/2+Y,1/2+X,1/2-Z
- symmetry= 1/2-Y,1/2-X,1/2-Z
- asymm= 0<=x<=1/2 and 0<=y<=1 and 0<=z<=1/4

## 119 I-4m2

- Number of Symmetry Operators = 16
- Space Group Name = I-4m2
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = -42m
- Patterson Space Group # = [139](#)
- Lattice Type = I
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= -Y,X,-Z
- symmetry= Y,-X,-Z
- symmetry= X,-Y,Z
- symmetry= -X,Y,Z
- symmetry= Y,X,-Z
- symmetry= -Y,-X,-Z
- symmetry= 1/2+X,1/2+Y,1/2+Z
- symmetry= 1/2-X,1/2-Y,1/2+Z
- symmetry= 1/2-Y,1/2+X,1/2-Z
- symmetry= 1/2+Y,1/2-X,1/2-Z
- symmetry= 1/2+X,1/2-Y,1/2+Z
- symmetry= 1/2-X,1/2+Y,1/2+Z
- symmetry= 1/2+Y,1/2+X,1/2-Z
- symmetry= 1/2-Y,1/2-X,1/2-Z
- asymm= 0<=x<=1/2 and 0<=y<=1/2 and 0<=z<=1/4

## 120 I-4c2

- Number of Symmetry Operators = 16
- Space Group Name = I-4c2
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = -42m
- Patterson Space Group # = [139](#)
- Lattice Type = I
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= Y,-X,-Z
- symmetry= -Y,X,-Z



- symmetry=  $X, -Y, 1/2+Z$
- symmetry=  $-X, Y, 1/2+Z$
- symmetry=  $Y, X, 1/2-Z$
- {\*\*\*}
- symmetry=  $-Y, -X, 1/2-Z$
- symmetry=  $X+1/2, Y+1/2, Z+1/2$
- symmetry=  $-X+1/2, -Y+1/2, Z+1/2$
- symmetry=  $Y+1/2, -X+1/2, -Z+1/2$
- symmetry=  $-Y+1/2, X+1/2, -Z+1/2$
- symmetry=  $X+1/2, -Y+1/2, Z$
- symmetry=  $-X+1/2, Y+1/2, Z$
- symmetry=  $Y+1/2, X+1/2, -Z$
- {\*\*\*}
- symmetry=  $-Y+1/2, -X+1/2, -Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/4$

## 121 I-42m

- Number of Symmetry Operators = 16
- Space Group Name = I-42m
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = -42m
- Patterson Space Group # = [139](#)
- Lattice Type = I
- symmetry=  $X, Y, Z$
- symmetry=  $-X, -Y, Z$
- symmetry=  $-Y, X, -Z$
- symmetry=  $Y, -X, -Z$
- symmetry=  $-X, Y, -Z$
- symmetry=  $X, -Y, -Z$
- symmetry=  $-Y, -X, Z$
- symmetry=  $Y, X, Z$
- symmetry=  $1/2+X, 1/2+Y, 1/2+Z$
- symmetry=  $1/2-X, 1/2-Y, 1/2+Z$
- symmetry=  $1/2-Y, 1/2+X, 1/2-Z$
- symmetry=  $1/2+Y, 1/2-X, 1/2-Z$
- symmetry=  $1/2-X, 1/2+Y, 1/2-Z$
- symmetry=  $1/2+X, 1/2-Y, 1/2-Z$
- symmetry=  $1/2-Y, 1/2-X, 1/2+Z$
- symmetry=  $1/2+Y, 1/2+X, 1/2+Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$  and  $x \leq y$

## 122 I-42d

- Number of Symmetry Operators = 16
- Space Group Name = I-42d
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = -42m
- Patterson Space Group # = [139](#)
- Lattice Type = I
- symmetry=  $X, Y, Z$
- symmetry=  $-X, -Y, Z$
- symmetry=  $-Y, X, -Z$
- symmetry=  $Y, -X, -Z$

- symmetry=  $1/2-X, Y, 3/4-Z$
- symmetry=  $1/2+X, -Y, 3/4-Z$
- symmetry=  $1/2-Y, -X, 3/4+Z$
- symmetry=  $1/2+Y, X, 3/4+Z$
- symmetry=  $1/2+X, 1/2+Y, 1/2+Z$
- symmetry=  $1/2-X, 1/2-Y, 1/2+Z$
- symmetry=  $1/2-Y, 1/2+X, 1/2-Z$
- symmetry=  $1/2+Y, 1/2-X, 1/2-Z$
- symmetry=  $-X, 1/2+Y, 1/4-Z$
- symmetry=  $X, 1/2-Y, 1/4-Z$
- symmetry=  $-Y, 1/2-X, 1/4+Z$
- symmetry=  $Y, 1/2+X, 1/4+Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1$  and  $0 \leq z \leq 1/8$

## 123 P4/mmm

- Number of Symmetry Operators = 16
- Space Group Name = P4/mmm
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = 4/mmm
- Patterson Space Group # = [123](#)
- Lattice Type = P
- symmetry=  $X, Y, Z$
- symmetry=  $-X, -Y, Z$
- symmetry=  $-Y, X, Z$
- symmetry=  $Y, -X, Z$
- symmetry=  $-X, Y, -Z$
- symmetry=  $X, -Y, -Z$
- symmetry=  $Y, X, -Z$
- symmetry=  $-Y, -X, -Z$
- symmetry=  $-X, -Y, -Z$
- symmetry=  $X, Y, -Z$
- symmetry=  $Y, -X, -Z$
- symmetry=  $-Y, X, -Z$
- symmetry=  $X, -Y, Z$
- symmetry=  $-X, Y, Z$
- symmetry=  $-Y, -X, Z$
- symmetry=  $Y, X, Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$  and  $x \leq y$

## 124 P4/mcc

- Number of Symmetry Operators = 16
- Space Group Name = P4/mcc
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = 4/mmm
- Patterson Space Group # = [123](#)
- Lattice Type = P
- symmetry=  $X, Y, Z$
- symmetry=  $-X, -Y, Z$
- symmetry=  $-Y, X, Z$
- symmetry=  $Y, -X, Z$
- symmetry=  $-X, Y, 1/2-Z$
- symmetry=  $X, -Y, 1/2-Z$

- symmetry=  $Y, X, 1/2-Z$
- symmetry=  $-Y, -X, 1/2-Z$
- symmetry=  $-X, -Y, -Z$
- symmetry=  $X, Y, -Z$
- symmetry=  $Y, -X, -Z$
- symmetry=  $-Y, X, -Z$
- symmetry=  $X, -Y, 1/2+Z$
- symmetry=  $-X, Y, 1/2+Z$
- symmetry=  $-Y, -X, 1/2+Z$
- symmetry=  $Y, X, 1/2+Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/4$

## 125 P4/nbm

- Number of Symmetry Operators = 16
- Space Group Name = P4/nbm
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = 4/mmm
- Patterson Space Group # = [123](#)
- Lattice Type = P
- symmetry=  $X, Y, Z$
- symmetry=  $-X, -Y, Z$
- symmetry=  $-Y, X, Z$
- symmetry=  $Y, -X, Z$
- symmetry=  $-X, Y, -Z$
- symmetry=  $X, -Y, -Z$
- symmetry=  $Y, X, -Z$
- symmetry=  $-Y, -X, -Z$
- symmetry=  $1/2-X, 1/2-Y, -Z$
- symmetry=  $1/2+X, 1/2+Y, -Z$
- symmetry=  $1/2+Y, 1/2-X, -Z$
- symmetry=  $1/2-Y, 1/2+X, -Z$
- symmetry=  $1/2+X, 1/2-Y, Z$
- symmetry=  $1/2-X, 1/2+Y, Z$
- symmetry=  $1/2-Y, 1/2-X, Z$
- symmetry=  $1/2+Y, 1/2+X, Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$  and  $y \leq 1/2-x$

## 126 P4/nnc

- Number of Symmetry Operators = 16
- Space Group Name = P4/nnc
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = 4/mmm
- Patterson Space Group # = [123](#)
- Lattice Type = P
- symmetry=  $X, Y, Z$
- symmetry=  $-X, -Y, Z$
- symmetry=  $-Y, X, Z$
- symmetry=  $Y, -X, Z$
- symmetry=  $-X, Y, -Z$
- symmetry=  $X, -Y, -Z$
- symmetry=  $Y, X, -Z$
- symmetry=  $-Y, -X, -Z$

- symmetry=  $1/2-X, 1/2-Y, 1/2-Z$
- symmetry=  $1/2+X, 1/2+Y, 1/2-Z$
- symmetry=  $1/2+Y, 1/2-X, 1/2-Z$
- symmetry=  $1/2-Y, 1/2+X, 1/2-Z$
- symmetry=  $1/2+X, 1/2-Y, 1/2+Z$
- symmetry=  $1/2-X, 1/2+Y, 1/2+Z$
- symmetry=  $1/2-Y, 1/2-X, 1/2+Z$
- symmetry=  $1/2+Y, 1/2+X, 1/2+Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/4$

## 127 P4/mbm

- Number of Symmetry Operators = 16
- Space Group Name = P4/mbm
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = 4/mmm
- Patterson Space Group # = [123](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= -Y,X,Z
- symmetry= Y,-X,Z
- symmetry=  $1/2-X, 1/2+Y, -Z$
- symmetry=  $1/2+X, 1/2-Y, -Z$
- symmetry=  $1/2+Y, 1/2+X, -Z$
- symmetry=  $1/2-Y, 1/2-X, -Z$
- symmetry= -X,-Y,-Z
- symmetry= X,Y,-Z
- symmetry= Y,-X,-Z
- symmetry= -Y,X,-Z
- symmetry=  $1/2+X, 1/2-Y, Z$
- symmetry=  $1/2-X, 1/2+Y, Z$
- symmetry=  $1/2-Y, 1/2-X, Z$
- symmetry=  $1/2+Y, 1/2+X, Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$  and  $y \leq 1/2-x$

## 128 P4/mnc

- Number of Symmetry Operators = 16
- Space Group Name = P4/mnc
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = 4/mmm
- Patterson Space Group # = [123](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= -Y,X,Z
- symmetry= Y,-X,Z
- symmetry=  $1/2-X, 1/2+Y, 1/2-Z$
- symmetry=  $1/2+X, 1/2-Y, 1/2-Z$
- symmetry=  $1/2+Y, 1/2+X, 1/2-Z$
- symmetry=  $1/2-Y, 1/2-X, 1/2-Z$
- symmetry= -X,-Y,-Z
- symmetry= X,Y,-Z

- symmetry=  $Y, -X, -Z$
- symmetry=  $-Y, X, -Z$
- symmetry=  $1/2+X, 1/2-Y, 1/2+Z$
- symmetry=  $1/2-X, 1/2+Y, 1/2+Z$
- symmetry=  $1/2-Y, 1/2-X, 1/2+Z$
- symmetry=  $1/2+Y, 1/2+X, 1/2+Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/4$

## 129 P4/nmm

- Number of Symmetry Operators = 16
- Space Group Name = P4/nmm
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = 4/mmm
- Patterson Space Group # = [123](#)
- Lattice Type = P
- symmetry=  $X, Y, Z$
- symmetry=  $-X, -Y, Z$
- symmetry=  $1/2-Y, 1/2+X, Z$
- symmetry=  $1/2+Y, 1/2-X, Z$
- symmetry=  $1/2-X, 1/2+Y, -Z$
- symmetry=  $1/2+X, 1/2-Y, -Z$
- symmetry=  $Y, X, -Z$
- symmetry=  $-Y, -X, -Z$
- symmetry=  $1/2-X, 1/2-Y, -Z$
- symmetry=  $1/2+X, 1/2+Y, -Z$
- symmetry=  $Y, -X, -Z$
- symmetry=  $-Y, X, -Z$
- symmetry=  $X, -Y, Z$
- symmetry=  $-X, Y, Z$
- symmetry=  $1/2-Y, 1/2-X, Z$
- symmetry=  $1/2+Y, 1/2+X, Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$  and  $y \leq 1/2-x$

## 130 P4/ncc

- Number of Symmetry Operators = 16
- Space Group Name = P4/ncc
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = 4/mmm
- Patterson Space Group # = [123](#)
- Lattice Type = P
- symmetry=  $X, Y, Z$
- symmetry=  $-X, -Y, Z$
- symmetry=  $1/2-Y, 1/2+X, Z$
- symmetry=  $1/2+Y, 1/2-X, Z$
- symmetry=  $1/2-X, 1/2+Y, 1/2-Z$
- symmetry=  $1/2+X, 1/2-Y, 1/2-Z$
- symmetry=  $Y, X, 1/2-Z$
- symmetry=  $-Y, -X, 1/2-Z$
- symmetry=  $1/2-X, 1/2-Y, -Z$
- symmetry=  $1/2+X, 1/2+Y, -Z$
- symmetry=  $Y, -X, -Z$
- symmetry=  $-Y, X, -Z$

- symmetry=  $X, -Y, 1/2+Z$
- symmetry=  $-X, Y, 1/2+Z$
- symmetry=  $1/2-Y, 1/2-X, 1/2+Z$
- symmetry=  $1/2+Y, 1/2+X, 1/2+Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/4$

## 131 P4(2)/mmc

- Number of Symmetry Operators = 16
- Space Group Name = P4(2)/mmc
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = 4/mmm
- Patterson Space Group # = [123](#)
- Lattice Type = P
- symmetry=  $X, Y, Z$
- symmetry=  $-X, -Y, Z$
- symmetry=  $-Y, X, 1/2+Z$
- symmetry=  $Y, -X, 1/2+Z$
- symmetry=  $-X, Y, -Z$
- symmetry=  $X, -Y, -Z$
- symmetry=  $Y, X, 1/2-Z$
- symmetry=  $-Y, -X, 1/2-Z$
- symmetry=  $-X, -Y, -Z$
- symmetry=  $X, Y, -Z$
- symmetry=  $Y, -X, 1/2-Z$
- symmetry=  $-Y, X, 1/2-Z$
- symmetry=  $X, -Y, Z$
- symmetry=  $-X, Y, Z$
- symmetry=  $-Y, -X, 1/2+Z$
- symmetry=  $Y, X, 1/2+Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/4$

## 132 P4(2)/mcm

- Number of Symmetry Operators = 16
- Space Group Name = P4(2)/mcm
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = 4/mmm
- Patterson Space Group # = [123](#)
- Lattice Type = P
- symmetry=  $X, Y, Z$
- symmetry=  $-X, -Y, Z$
- symmetry=  $-Y, X, 1/2+Z$
- symmetry=  $Y, -X, 1/2+Z$
- symmetry=  $-X, Y, 1/2-Z$
- symmetry=  $X, -Y, 1/2-Z$
- symmetry=  $Y, X, -Z$
- symmetry=  $-Y, -X, -Z$
- symmetry=  $-X, -Y, -Z$
- symmetry=  $X, Y, -Z$
- symmetry=  $Y, -X, 1/2-Z$
- symmetry=  $-Y, X, 1/2-Z$
- symmetry=  $X, -Y, 1/2+Z$
- symmetry=  $-X, Y, 1/2+Z$

- symmetry= -Y,-X,Z
- symmetry= Y,X,Z
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$  and  $x \leq y$

## 133 P4(2)/nbc

- Number of Symmetry Operators = 16
- Space Group Name = P4(2)/nbc
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = 4/mmm
- Patterson Space Group # = [123](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry=  $1/2 - Y, 1/2 + X, 1/2 + Z$
- symmetry=  $1/2 + Y, 1/2 - X, 1/2 + Z$
- symmetry= -X,Y, $1/2 - Z$
- symmetry= X,-Y, $1/2 - Z$
- symmetry=  $1/2 + Y, 1/2 + X, -Z$
- symmetry=  $1/2 - Y, 1/2 - X, -Z$
- symmetry=  $1/2 - X, 1/2 - Y, 1/2 - Z$
- symmetry=  $1/2 + X, 1/2 + Y, 1/2 - Z$
- symmetry= Y,-X,-Z
- symmetry= -Y,X,-Z
- symmetry=  $1/2 + X, 1/2 - Y, Z$
- symmetry=  $1/2 - X, 1/2 + Y, Z$
- symmetry= -Y,-X, $1/2 + Z$
- symmetry= Y,X, $1/2 + Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/4$

## 134 P4(2)/nnm

- Number of Symmetry Operators = 16
- Space Group Name = P4(2)/nnm
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = 4/mmm
- Patterson Space Group # = [123](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry=  $1/2 - Y, 1/2 + X, 1/2 + Z$
- symmetry=  $1/2 + Y, 1/2 - X, 1/2 + Z$
- symmetry= -X,Y,-Z
- symmetry= X,-Y,-Z
- symmetry=  $1/2 + Y, 1/2 + X, 1/2 - Z$
- symmetry=  $1/2 - Y, 1/2 - X, 1/2 - Z$
- symmetry=  $1/2 - X, 1/2 - Y, 1/2 - Z$
- symmetry=  $1/2 + X, 1/2 + Y, 1/2 - Z$
- symmetry= Y,-X,-Z
- symmetry= -Y,X,-Z
- symmetry=  $1/2 + X, 1/2 - Y, 1/2 + Z$
- symmetry=  $1/2 - X, 1/2 + Y, 1/2 + Z$
- symmetry= -Y,-X,Z
- symmetry= Y,X,Z

- $\text{asymm} = 0 \leq x \leq 1/2$  and  $0 \leq y \leq 1$  and  $0 \leq z \leq 1/4$  and  $x \leq y$  and  $y \leq 1-x$

## 135 P4(2)/mbc

- Number of Symmetry Operators = 16
- Space Group Name = P4(2)/mbc
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = 4/mmm
- Patterson Space Group # = [123](#)
- Lattice Type = P
- symmetry = X,Y,Z
- symmetry = -X,-Y,Z
- symmetry = -Y,X,1/2+Z
- symmetry = Y,-X,1/2+Z
- symmetry = 1/2-X,1/2+Y,-Z
- symmetry = 1/2+X,1/2-Y,-Z
- symmetry = 1/2+Y,1/2+X,1/2-Z
- symmetry = 1/2-Y,1/2-X,1/2-Z
- symmetry = -X,-Y,-Z
- symmetry = X,Y,-Z
- symmetry = Y,-X,1/2-Z
- symmetry = -Y,X,1/2-Z
- symmetry = 1/2+X,1/2-Y,Z
- symmetry = 1/2-X,1/2+Y,Z
- symmetry = 1/2-Y,1/2-X,1/2+Z
- symmetry = 1/2+Y,1/2+X,1/2+Z
- $\text{asymm} = 0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/4$

## 136 P4(2)/mnm

- Number of Symmetry Operators = 16
- Space Group Name = P4(2)/mnm
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = 4/mmm
- Patterson Space Group # = [123](#)
- Lattice Type = P
- symmetry = X,Y,Z
- symmetry = -X,-Y,Z
- symmetry = 1/2-Y,X+1/2,Z+1/2
- symmetry = Y+1/2,1/2-X,Z+1/2
- symmetry = 1/2-X,Y+1/2,1/2-Z
- symmetry = X+1/2,1/2-Y,1/2-Z
- symmetry = Y,X,-Z
- symmetry = -Y,-X,-Z
- symmetry = -X,-Y,-Z
- symmetry = X,Y,-Z
- symmetry = Y+1/2,1/2-X,1/2-Z
- symmetry = 1/2-Y,X+1/2,1/2-Z
- symmetry = X+1/2,1/2-Y,Z+1/2
- symmetry = 1/2-X,Y+1/2,Z+1/2
- symmetry = -Y,-X,Z
- symmetry = Y,X,Z
- $\text{asymm} = 0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$  and  $x \leq y$



## 137 P4(2)/nmc

- Number of Symmetry Operators = 16
- Space Group Name = P4(2)/nmc
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = 4/mmm
- Patterson Space Group # = [123](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= 1/2-Y,1/2+X,1/2+Z
- symmetry= 1/2+Y,1/2-X,1/2+Z
- symmetry= 1/2-X,1/2+Y,1/2-Z
- symmetry= 1/2+X,1/2-Y,1/2-Z
- symmetry= Y,X,-Z
- symmetry= -Y,-X,-Z
- symmetry= 1/2-X,1/2-Y,1/2-Z
- symmetry= 1/2+X,1/2+Y,1/2-Z
- symmetry= Y,-X,-Z
- symmetry= -Y,X,-Z
- symmetry= X,-Y,Z
- symmetry= -X,Y,Z
- symmetry= 1/2-Y,1/2-X,1/2+Z
- symmetry= 1/2+Y,1/2+X,1/2+Z
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/4$

## 138 P4(2)/ncm

- Number of Symmetry Operators = 16
- Space Group Name = P4(2)/ncm
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = 4/mmm
- Patterson Space Group # = [123](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= 1/2-Y,1/2+X,1/2+Z
- symmetry= 1/2+Y,1/2-X,1/2+Z
- symmetry= 1/2-X,1/2+Y,-Z
- symmetry= 1/2+X,1/2-Y,-Z
- symmetry= Y,X,1/2-Z
- symmetry= -Y,-X,1/2-Z
- symmetry= 1/2-X,1/2-Y,1/2-Z
- symmetry= 1/2+X,1/2+Y,1/2-Z
- symmetry= Y,-X,-Z
- symmetry= -Y,X,-Z
- symmetry= X,-Y,1/2+Z
- symmetry= -X,Y,1/2+Z
- symmetry= 1/2-Y,1/2-X,Z
- symmetry= 1/2+Y,1/2+X,Z
- asymm=  $0 \leq x \leq 1/4$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1$  and  $x \leq y$  and  $y \leq 1/2-x$

## 139 I4/mmm

- Number of Symmetry Operators = 32
- Space Group Name = I4/mmm
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = 4/mmm
- Patterson Space Group # = [139](#)
- Lattice Type = I
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= -Y,X,Z
- symmetry= Y,-X,Z
- symmetry= -X,Y,-Z
- symmetry= X,-Y,-Z
- symmetry= Y,X,-Z
- symmetry= -Y,-X,-Z
- symmetry= -X,-Y,-Z
- symmetry= X,Y,-Z
- symmetry= Y,-X,-Z
- symmetry= -Y,X,-Z
- symmetry= X,-Y,Z
- symmetry= -X,Y,Z
- symmetry= -Y,-X,Z
- symmetry= Y,X,Z
- symmetry=  $1/2+X, 1/2+Y, 1/2+Z$
- symmetry=  $1/2-X, 1/2-Y, 1/2+Z$
- symmetry=  $1/2-Y, 1/2+X, 1/2+Z$
- symmetry=  $1/2+Y, 1/2-X, 1/2+Z$
- symmetry=  $1/2-X, 1/2+Y, 1/2-Z$
- symmetry=  $1/2+X, 1/2-Y, 1/2-Z$
- symmetry=  $1/2+Y, 1/2+X, 1/2-Z$
- symmetry=  $1/2-Y, 1/2-X, 1/2-Z$
- symmetry=  $1/2-X, 1/2-Y, 1/2-Z$
- symmetry=  $1/2+X, 1/2+Y, 1/2-Z$
- symmetry=  $1/2+Y, 1/2-X, 1/2-Z$
- symmetry=  $1/2-Y, 1/2+X, 1/2-Z$
- symmetry=  $1/2+X, 1/2-Y, 1/2+Z$
- symmetry=  $1/2-X, 1/2+Y, 1/2+Z$
- symmetry=  $1/2-Y, 1/2-X, 1/2+Z$
- symmetry=  $1/2+Y, 1/2+X, 1/2+Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/4$  and  $x \leq y$

## 140 I4/mcm

- Number of Symmetry Operators = 32
- Space Group Name = I4/mcm
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = 4/mmm
- Patterson Space Group # = [139](#)
- Lattice Type = I
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= -Y,X,Z
- symmetry= Y,-X,Z
- symmetry= -X,Y,1/2-Z
- symmetry= X,-Y,1/2-Z
- symmetry= Y,X,1/2-Z

- symmetry=  $-Y, -X, 1/2-Z$
- symmetry=  $-X, -Y, -Z$
- symmetry=  $X, Y, -Z$
- symmetry=  $Y, -X, -Z$
- symmetry=  $-Y, X, -Z$
- symmetry=  $X, -Y, 1/2+Z$
- symmetry=  $-X, Y, 1/2+Z$
- symmetry=  $-Y, -X, 1/2+Z$
- symmetry=  $Y, X, 1/2+Z$
- symmetry=  $1/2+X, 1/2+Y, 1/2+Z$
- symmetry=  $1/2-X, 1/2-Y, 1/2+Z$
- symmetry=  $1/2-Y, 1/2+X, 1/2+Z$
- symmetry=  $1/2+Y, 1/2-X, 1/2+Z$
- symmetry=  $1/2-X, 1/2+Y, -Z$
- symmetry=  $1/2+X, 1/2-Y, -Z$
- symmetry=  $1/2+Y, 1/2+X, -Z$
- symmetry=  $1/2-Y, 1/2-X, -Z$
- symmetry=  $1/2-X, 1/2-Y, 1/2-Z$
- symmetry=  $1/2+X, 1/2+Y, 1/2-Z$
- symmetry=  $1/2+Y, 1/2-X, 1/2-Z$
- symmetry=  $1/2-Y, 1/2+X, 1/2-Z$
- symmetry=  $1/2+X, 1/2-Y, Z$
- symmetry=  $1/2-X, 1/2+Y, Z$
- symmetry=  $1/2-Y, 1/2-X, Z$
- symmetry=  $1/2+Y, 1/2+X, Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/4$  and  $y \leq 1/2-x$

## 141 I4(1)/amd

- Number of Symmetry Operators = 32
- Space Group Name = I4(1)/amd
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = 4/mmm
- Patterson Space Group # = [139](#)
- Lattice Type = I
- symmetry=  $X, Y, Z$
- symmetry=  $1/2-X, 1/2-Y, 1/2+Z$
- symmetry=  $-Y, 1/2+X, 1/4+Z$
- symmetry=  $1/2+Y, -X, 3/4+Z$
- symmetry=  $1/2-X, Y, 3/4-Z$
- symmetry=  $X, 1/2-Y, 1/4-Z$
- symmetry=  $1/2+Y, 1/2+X, 1/2-Z$
- symmetry=  $-Y, -X, -Z$
- symmetry=  $-X, 1/2-Y, 1/4-Z$
- symmetry=  $1/2+X, Y, 3/4-Z$
- symmetry=  $Y, -X, -Z$
- symmetry=  $1/2-Y, 1/2+X, 1/2-Z$
- symmetry=  $1/2+X, 1/2-Y, 1/2+Z$
- symmetry=  $-X, Y, Z$
- symmetry=  $1/2-Y, -X, 3/4+Z$
- symmetry=  $Y, 1/2+X, 1/4+Z$
- symmetry=  $1/2+X, 1/2+Y, 1/2+Z$
- symmetry=  $-X, -Y, Z$
- symmetry=  $1/2-Y, X, 3/4+Z$
- symmetry=  $Y, 1/2-X, 1/4+Z$
- symmetry=  $-X, 1/2+Y, 1/4-Z$

- symmetry=  $1/2+X,-Y,3/4-Z$
- symmetry=  $Y,X,-Z$
- symmetry=  $1/2-Y,1/2-X,1/2-Z$
- symmetry=  $1/2-X,-Y,3/4-Z$
- symmetry=  $X,1/2+Y,1/4-Z$
- symmetry=  $1/2+Y,1/2-X,1/2-Z$
- symmetry=  $-Y,X,-Z$
- symmetry=  $X,-Y,Z$
- symmetry=  $1/2-X,1/2+Y,1/2+Z$
- symmetry=  $-Y,1/2-X,1/4+Z$
- symmetry=  $1/2+Y,X,3/4+Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/8$

## 142 I4(1)/acd

- Number of Symmetry Operators = 32
- Space Group Name = I4(1)/acd
- Crystal System = TETRAGONAL
- Laue Class = 4/mmm
- Point Group = 4/mmm
- Patterson Space Group # = [139](#)
- Lattice Type = I
- symmetry=  $X,Y,Z$
- symmetry=  $1/2-X,1/2-Y,1/2+Z$
- symmetry=  $-Y,1/2+X,1/4+Z$
- symmetry=  $1/2+Y,-X,3/4+Z$
- symmetry=  $1/2-X,Y,1/4-Z$
- symmetry=  $X,1/2-Y,3/4-Z$
- symmetry=  $1/2+Y,1/2+X,-Z$
- symmetry=  $-Y,-X,1/2-Z$
- symmetry=  $-X,1/2-Y,1/4-Z$
- symmetry=  $1/2+X,Y,3/4-Z$
- symmetry=  $Y,-X,-Z$
- symmetry=  $1/2-Y,1/2+X,1/2-Z$
- symmetry=  $1/2+X,1/2-Y,Z$
- symmetry=  $-X,Y,1/2+Z$
- symmetry=  $1/2-Y,-X,1/4+Z$
- symmetry=  $Y,1/2+X,3/4+Z$
- symmetry=  $1/2+X,1/2+Y,1/2+Z$
- symmetry=  $-X,-Y,Z$
- symmetry=  $1/2-Y,X,3/4+Z$
- symmetry=  $Y,1/2-X,1/4+Z$
- symmetry=  $-X,1/2+Y,3/4-Z$
- symmetry=  $1/2+X,-Y,1/4-Z$
- symmetry=  $Y,X,1/2-Z$
- symmetry=  $1/2-Y,1/2-X,-Z$
- symmetry=  $1/2-X,-Y,3/4-Z$
- symmetry=  $X,1/2+Y,1/4-Z$
- symmetry=  $1/2+Y,1/2-X,1/2-Z$
- symmetry=  $-Y,X,-Z$
- symmetry=  $X,-Y,1/2+Z$
- symmetry=  $1/2-X,1/2+Y,Z$
- symmetry=  $-Y,1/2-X,3/4+Z$
- symmetry=  $1/2+Y,X,1/4+Z$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/8$

## 143 P3

- Number of Symmetry Operators = 3
- Space Group Name = P3
- Crystal System = TRIGONAL
- Laue Class = -3
- Point Group = 3
- Patterson Space Group # = [147](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -Y,X-Y,Z
- symmetry= Y-X,-X,Z
- asymm=  $0 \leq x \leq 2/3$  and  $0 \leq y \leq 2/3$  and  $0 \leq z \leq 1$  and  $x \leq (1+y)/2$  and  $y \leq \min(1-x, (1+x)/2)$

## 144 P3(1)

- Number of Symmetry Operators = 3
- Space Group Name = P3(1)
- Crystal System = TRIGONAL
- Laue Class = -3
- Point Group = 3
- Patterson Space Group # = [147](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -Y,X-Y,Z+1/3
- symmetry= Y-X,-X,Z+2/3
- asymm=  $0 \leq x \leq 1$  and  $0 \leq y \leq 1$  and  $0 \leq z \leq 1/3$

## 145 P3(2)

- Number of Symmetry Operators = 3
- Space Group Name = P3(2)
- Crystal System = TRIGONAL
- Laue Class = -3
- Point Group = 3
- Patterson Space Group # = [147](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -Y,X-Y,Z+2/3
- symmetry= Y-X,-X,Z+1/3
- asymm=  $0 \leq x \leq 1$  and  $0 \leq y \leq 1$  and  $0 \leq z \leq 1/3$

## 146 R3

- Number of Symmetry Operators = 9
- Space Group Name = R3
- Crystal System = TRIGONAL
- Laue Class = -3
- Point Group = 3
- Patterson Space Group # = [148](#)
- Lattice Type = R
- symmetry= X,Y,Z
- symmetry= -Y,X-Y,Z
- symmetry= Y-X,-X,Z
- symmetry=  $X+2/3, Y+1/3, Z+1/3$

- symmetry=  $-Y+2/3, X-Y+1/3, Z+1/3$
- symmetry=  $Y-X+2/3, -X+1/3, Z+1/3$
- symmetry=  $X+1/3, Y+2/3, Z+2/3$
- symmetry=  $-Y+1/3, X-Y+2/3, Z+2/3$
- symmetry=  $Y-X+1/3, -X+2/3, Z+2/3$
- asymm=  $0 \leq x \leq 2/3$  and  $0 \leq y \leq 2/3$  and  $0 \leq z \leq 1/3$  and  $x \leq (1+y)/2$  and  $y \leq \min(1-x, (1+x)/2)$

## 147 P-3

- Number of Symmetry Operators = 6
- Space Group Name = P-3
- Crystal System = TRIGONAL
- Laue Class = -3
- Point Group = -3
- Patterson Space Group # = [147](#)
- Lattice Type = P
- symmetry=  $X, Y, Z$
- symmetry=  $-Y, X-Y, Z$
- symmetry=  $Y-X, -X, Z$
- symmetry=  $-X, -Y, -Z$
- symmetry=  $Y, Y-X, -Z$
- symmetry=  $X-Y, X, -Z$
- asymm=  $0 \leq x \leq 2/3$  and  $0 \leq y \leq 2/3$  and  $0 \leq z \leq 1/2$  and  $x \leq (1+y)/2$  and  $y \leq \min(1-x, (1+x)/2)$

## 148 R-3

- Number of Symmetry Operators = 18
- Space Group Name = R-3
- Crystal System = TRIGONAL
- Laue Class = -3
- Point Group = -3
- Patterson Space Group # = [148](#)
- Lattice Type = R
- symmetry=  $X, Y, Z$
- symmetry=  $-Y, X-Y, Z$
- symmetry=  $Y-X, -X, Z$
- symmetry=  $-X, -Y, -Z$
- symmetry=  $Y, Y-X, -Z$
- symmetry=  $X-Y, X, -Z$
- symmetry=  $2/3+X, 1/3+Y, 1/3+Z$
- symmetry=  $2/3-Y, 1/3+X-Y, 1/3+Z$
- symmetry=  $2/3+Y-X, 1/3-X, 1/3+Z$
- symmetry=  $2/3-X, 1/3-Y, 1/3-Z$
- symmetry=  $2/3+Y, 1/3+Y-X, 1/3-Z$
- symmetry=  $2/3+X-Y, 1/3+X, 1/3-Z$
- symmetry=  $1/3+X, 2/3+Y, 2/3+Z$
- symmetry=  $1/3-Y, 2/3+X-Y, 2/3+Z$
- symmetry=  $1/3+Y-X, 2/3-X, 2/3+Z$
- symmetry=  $1/3-X, 2/3-Y, 2/3-Z$
- symmetry=  $1/3+Y, 2/3+Y-X, 2/3-Z$
- symmetry=  $1/3+X-Y, 2/3+X, 2/3-Z$
- asymm=  $0 \leq x \leq 2/3$  and  $0 \leq y \leq 2/3$  and  $0 \leq z \leq 1/6$  and  $x \leq (1+y)/2$  and  $y \leq \min(1-x, (1+x)/2)$

## 149 P312

- Number of Symmetry Operators = 6
- Space Group Name = P312
- Crystal System = TRIGONAL
- Laue Class =  $\bar{3}m$
- Point Group = 32
- Patterson Space Group # = [162](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry=  $\bar{Y},X\bar{Y},Z$
- symmetry=  $Y\bar{X},\bar{X}Z$
- symmetry=  $\bar{Y},\bar{X},\bar{Z}$
- symmetry=  $Y\bar{X},Y,\bar{Z}$
- symmetry=  $X,X\bar{Y},\bar{Z}$
- asymm=  $0 \leq x \leq 2/3$  and  $0 \leq y \leq 2/3$  and  $0 \leq z \leq 1/2$  and  $x \leq (1+y)/2$  and  $y \leq \min(1-x, (1+x)/2)$

## 150 P321

- Number of Symmetry Operators = 6
- Space Group Name = P321
- Crystal System = TRIGONAL
- Laue Class =  $\bar{3}m$
- Point Group = 32
- Patterson Space Group # = [164](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry=  $\bar{Y},X\bar{Y},Z$
- symmetry=  $Y\bar{X},\bar{X}Z$
- symmetry=  $Y,X,\bar{Z}$
- symmetry=  $X\bar{Y},\bar{Y},\bar{Z}$
- symmetry=  $\bar{X},Y\bar{X},\bar{Z}$
- asymm=  $0 \leq x \leq 2/3$  and  $0 \leq y \leq 2/3$  and  $0 \leq z \leq 1/2$  and  $x \leq (1+y)/2$  and  $y \leq \min(1-x, (1+x)/2)$

## 151 P3(1)12

- Number of Symmetry Operators = 6
- Space Group Name = P3(1)12
- Crystal System = TRIGONAL
- Laue Class =  $\bar{3}m$
- Point Group = 32
- Patterson Space Group # = [162](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry=  $\bar{Y},X\bar{Y},1/3+Z$
- symmetry=  $Y\bar{X},\bar{X},2/3+Z$
- symmetry=  $\bar{Y},\bar{X},2/3\bar{Z}$
- symmetry=  $Y\bar{X},Y,1/3\bar{Z}$
- symmetry=  $X,X\bar{Y},\bar{Z}$
- asymm=  $0 \leq x \leq 1$  and  $0 \leq y \leq 1$  and  $0 \leq z \leq 1/6$

## 152 P3(1)21

- Number of Symmetry Operators = 6
- Space Group Name = P3(1)21
- Crystal System = TRIGONAL
- Laue Class =  $\bar{3}m$

- Point Group = 32
- Patterson Space Group # = [164](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -Y,X-Y,Z+1/3
- symmetry= Y-X,-X,Z+2/3
- symmetry= Y,X,-Z
- symmetry= X-Y,-Y,2/3-Z
- symmetry= -X,Y-X,1/3-Z
- asymm=  $0 \leq x \leq 1$  and  $0 \leq y \leq 1$  and  $0 \leq z \leq 1/6$

## 153 P3(2)12

- Number of Symmetry Operators = 6
- Space Group Name = P3(2)12
- Crystal System = TRIGONAL
- Laue Class = -3m
- Point Group = 32
- Patterson Space Group # = [162](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -Y,X-Y,2/3+Z
- symmetry= Y-X,-X,1/3+Z
- symmetry= -Y,-X,1/3-Z
- symmetry= Y-X,Y,2/3-Z
- symmetry= X,X-Y,-Z
- asymm=  $0 \leq x \leq 1$  and  $0 \leq y \leq 1$  and  $0 \leq z \leq 1/6$

## 154 P3(2)21

- Number of Symmetry Operators = 6
- Space Group Name = P3(2)21
- Crystal System = TRIGONAL
- Laue Class = -3m
- Point Group = 32
- Patterson Space Group # = [164](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -Y,X-Y,Z+2/3
- symmetry= Y-X,-X,Z+1/3
- symmetry= Y,X,-Z
- symmetry= X-Y,-Y,1/3-Z
- symmetry= -X,Y-X,2/3-Z
- asymm=  $0 \leq x \leq 1$  and  $0 \leq y \leq 1$  and  $0 \leq z \leq 1/6$

## 155 R32

- Number of Symmetry Operators = 18
- Space Group Name = R32
- Crystal System = TRIGONAL
- Laue Class = -3m
- Point Group = 32
- Patterson Space Group # = [166](#)
- Lattice Type = R
- symmetry= X,Y,Z



- symmetry=  $-Y, X-Y, Z$
- symmetry=  $Y-X, -X, Z$
- symmetry=  $Y, X, -Z$
- symmetry=  $X-Y, -Y, -Z$
- symmetry=  $-X, Y-X, -Z$
- symmetry=  $2/3+X, 1/3+Y, 1/3+Z$
- symmetry=  $2/3-Y, 1/3+X-Y, 1/3+Z$
- symmetry=  $2/3+Y-X, 1/3-X, 1/3+Z$
- symmetry=  $2/3+Y, 1/3+X, 1/3-Z$
- symmetry=  $2/3+X-Y, 1/3-Y, 1/3-Z$
- symmetry=  $2/3-X, 1/3+Y-X, 1/3-Z$
- symmetry=  $1/3+X, 2/3+Y, 2/3+Z$
- symmetry=  $1/3-Y, 2/3+X-Y, 2/3+Z$
- symmetry=  $1/3+Y-X, 2/3-X, 2/3+Z$
- symmetry=  $1/3+Y, 2/3+X, 2/3-Z$
- symmetry=  $1/3+X-Y, 2/3-Y, 2/3-Z$
- symmetry=  $1/3-X, 2/3+Y-X, 2/3-Z$
- asymm=  $0 \leq x \leq 2/3$  and  $0 \leq y \leq 2/3$  and  $0 \leq z \leq 1/6$  and  $x \leq (1+y)/2$  and  $y \leq \min(1-x, (1+x)/2)$

## 156 P3m1

- Number of Symmetry Operators = 6
- Space Group Name = P3m1
- Crystal System = TRIGONAL
- Laue Class =  $-3m$
- Point Group =  $3m$
- Patterson Space Group # = [164](#)
- Lattice Type = P
- symmetry=  $X, Y, Z$
- symmetry=  $-Y, X-Y, Z$
- symmetry=  $Y-X, -X, Z$
- symmetry=  $-Y, -X, Z$
- symmetry=  $Y-X, Y, Z$
- symmetry=  $X, X-Y, Z$
- asymm=  $0 \leq x \leq 2/3$  and  $0 \leq y \leq 2/3$  and  $0 \leq z \leq 1$  and  $x \leq 2y$  and  $y \leq \min(1-x, 2x)$

## 157 P31m

- Number of Symmetry Operators = 6
- Space Group Name = P31m
- Crystal System = TRIGONAL
- Laue Class =  $-3m$
- Point Group =  $3m$
- Patterson Space Group # = [162](#)
- Lattice Type = P
- symmetry=  $X, Y, Z$
- symmetry=  $-Y, X-Y, Z$
- symmetry=  $Y-X, -X, Z$
- symmetry=  $Y, X, Z$
- symmetry=  $X-Y, -Y, Z$
- symmetry=  $-X, Y-X, Z$
- asymm=  $0 \leq x \leq 2/3$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1$  and  $x \leq (y+1)/2$  and  $y \leq \min(1-x, x)$

## 158 P3c1

- Number of Symmetry Operators = 6
- Space Group Name = P3c1
- Crystal System = TRIGONAL
- Laue Class =  $\bar{3}m$
- Point Group =  $3m$
- Patterson Space Group # = [164](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry=  $\bar{Y},X\bar{Y},Z$
- symmetry=  $Y\bar{X},\bar{X},Z$
- symmetry=  $\bar{Y},\bar{X},1/2+Z$
- symmetry=  $Y\bar{X},Y,1/2+Z$
- symmetry=  $X,\bar{X},1/2+Z$
- asymm=  $0 \leq x \leq 2/3$  and  $0 \leq y \leq 2/3$  and  $0 \leq z \leq 1/2$  and  $x \leq (1+y)/2$  and  $y \leq \min(1-x, (1+x)/2)$

## 159 P31c

- Number of Symmetry Operators = 6
- Space Group Name = P31c
- Crystal System = TRIGONAL
- Laue Class =  $\bar{3}m$
- Point Group =  $3m$
- Patterson Space Group # = [162](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry=  $\bar{Y},X\bar{Y},Z$
- symmetry=  $Y\bar{X},\bar{X},Z$
- symmetry=  $Y,X,1/2+Z$
- symmetry=  $X\bar{Y},\bar{Y},1/2+Z$
- symmetry=  $\bar{X},Y\bar{X},1/2+Z$
- asymm=  $0 \leq x \leq 2/3$  and  $0 \leq y \leq 2/3$  and  $0 \leq z \leq 1/2$  and  $x \leq (1+y)/2$  and  $y \leq \min(1-x, (1+x)/2)$

## 160 R3m

- Number of Symmetry Operators = 18
  - Space Group Name = R3m
  - Crystal System = TRIGONAL
  - Laue Class =  $\bar{3}m$
  - Point Group =  $3m$
  - Patterson Space Group # = [166](#)
  - Lattice Type = R
  - symmetry= X,Y,Z
  - symmetry=  $\bar{Y},X\bar{Y},Z$
  - symmetry=  $Y\bar{X},\bar{X},Z$
  - symmetry=  $\bar{Y},\bar{X},Z$
  - symmetry=  $Y\bar{X},Y,Z$
  - symmetry=  $X,\bar{X},\bar{Y},Z$
  - symmetry=  $2/3+X,1/3+Y,1/3+Z$
  - symmetry=  $2/3-\bar{Y},1/3+X-\bar{Y},1/3+Z$
  - symmetry=  $2/3+Y-\bar{X},1/3-\bar{X},1/3+Z$
  - symmetry=  $2/3-\bar{Y},1/3-\bar{X},1/3+Z$
  - symmetry=  $2/3+Y-\bar{X},1/3+Y,1/3+Z$
  - symmetry=  $2/3+X,1/3+X-\bar{Y},1/3+Z$
  - symmetry=  $1/3+X,2/3+Y,2/3+Z$
  - symmetry=  $1/3-\bar{Y},2/3+X-\bar{Y},2/3+Z$
- {\*\*\*}

- symmetry=  $1/3+Y-X, 2/3-X, 2/3+Z$
- symmetry=  $1/3-Y, 2/3-X, 2/3+Z$
- symmetry=  $1/3+Y-X, 2/3+Y, 2/3+Z$
- symmetry=  $1/3+X, 2/3+X-Y, 2/3+Z$
- asymm=  $0 \leq x \leq 2/3$  and  $0 \leq y \leq 2/3$  and  $0 \leq z \leq 1/3$  and  $x \leq 2y$  and  $y \leq \min(1-x, 2x)$

## 161 R3c

- Number of Symmetry Operators = 18
- Space Group Name = R3c
- Crystal System = TRIGONAL
- Laue Class =  $\bar{3}m$
- Point Group =  $3m$
- Patterson Space Group # = [166](#)
- Lattice Type = R
- symmetry=  $X, Y, Z$
- symmetry=  $-Y, X-Y, Z$
- symmetry=  $Y-X, -X, Z$
- symmetry=  $-Y, -X, 1/2+Z$
- symmetry=  $Y-X, Y, 1/2+Z$
- symmetry=  $X, X-Y, 1/2+Z$
- symmetry=  $2/3+X, 1/3+Y, 1/3+Z$
- symmetry=  $2/3-Y, 1/3+X-Y, 1/3+Z$
- symmetry=  $2/3+Y-X, 1/3-X, 1/3+Z$
- symmetry=  $2/3-Y, 1/3-X, 5/6+Z$
- symmetry=  $2/3+Y-X, 1/3+Y, 5/6+Z$
- symmetry=  $2/3+X, 1/3+X-Y, 5/6+Z$
- symmetry=  $1/3+X, 2/3+Y, 2/3+Z$
- symmetry=  $1/3-Y, 2/3+X-Y, 2/3+Z$
- symmetry=  $1/3+Y-X, 2/3-X, 2/3+Z$
- symmetry=  $1/3-Y, 2/3-X, 1/6+Z$
- symmetry=  $1/3+Y-X, 2/3+Y, 1/6+Z$
- symmetry=  $1/3+X, 2/3+X-Y, 1/6+Z$
- asymm=  $0 \leq x \leq 2/3$  and  $0 \leq y \leq 2/3$  and  $0 \leq z \leq 1/6$  and  $x \leq (1+y)/2$  and  $y \leq \min(1-x, (1+x)/2)$

## 162 P-31m

- Number of Symmetry Operators = 12
- Space Group Name = P-31m
- Crystal System = TRIGONAL
- Laue Class =  $\bar{3}m$
- Point Group =  $\bar{3}m$
- Patterson Space Group # = [162](#)
- Lattice Type = P
- symmetry=  $X, Y, Z$
- symmetry=  $-Y, X-Y, Z$
- symmetry=  $Y-X, -X, Z$
- symmetry=  $-Y, -X, -Z$
- symmetry=  $Y-X, Y, -Z$
- symmetry=  $X, X-Y, -Z$
- symmetry=  $-X, -Y, -Z$
- symmetry=  $Y, Y-X, -Z$
- symmetry=  $X-Y, X, -Z$
- symmetry=  $Y, X, Z$
- symmetry=  $X-Y, -Y, Z$
- symmetry=  $-X, Y-X, Z$

- $\text{asymm} = 0 \leq x \leq 2/3$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$  and  $x \leq (1+y)/2$  and  $y \leq \min(1-x, x)$

## 163 P-31c

- Number of Symmetry Operators = 12
- Space Group Name = P-31c
- Crystal System = TRIGONAL
- Laue Class =  $\bar{3}m$
- Point Group =  $\bar{3}m$
- Patterson Space Group # = [162](#)
- Lattice Type = P
- symmetry = X,Y,Z
- symmetry =  $\bar{Y}, X-\bar{Y}, Z$
- symmetry =  $Y-\bar{X}, -\bar{X}, Z$
- symmetry =  $\bar{Y}, -\bar{X}, 1/2-\bar{Z}$
- symmetry =  $Y-\bar{X}, Y, 1/2-\bar{Z}$
- symmetry =  $X, X-\bar{Y}, 1/2-\bar{Z}$
- symmetry =  $\bar{X}, -\bar{Y}, -\bar{Z}$
- symmetry =  $Y, Y-\bar{X}, -\bar{Z}$
- symmetry =  $X-\bar{Y}, X, -\bar{Z}$
- symmetry =  $Y, X, 1/2+\bar{Z}$
- symmetry =  $X-\bar{Y}, -\bar{Y}, 1/2+\bar{Z}$
- symmetry =  $\bar{X}, Y-\bar{X}, 1/2+\bar{Z}$
- $\text{asymm} = 0 \leq x \leq 2/3$  and  $0 \leq y \leq 2/3$  and  $0 \leq z \leq 1/4$  and  $x \leq (1+y)/2$  and  $y \leq \min(1-x, (1+x)/2)$

## 164 P-3m1

- Number of Symmetry Operators = 12
- Space Group Name = P-3m1
- Crystal System = TRIGONAL
- Laue Class =  $\bar{3}m$
- Point Group =  $\bar{3}m$
- Patterson Space Group # = [164](#)
- Lattice Type = P
- symmetry = X,Y,Z
- symmetry =  $\bar{Y}, X-\bar{Y}, Z$
- symmetry =  $Y-\bar{X}, -\bar{X}, Z$
- symmetry =  $Y, X, -\bar{Z}$
- symmetry =  $X-\bar{Y}, -\bar{Y}, -\bar{Z}$
- symmetry =  $\bar{X}, Y-\bar{X}, -\bar{Z}$
- symmetry =  $\bar{X}, -\bar{Y}, -\bar{Z}$
- symmetry =  $Y, Y-\bar{X}, -\bar{Z}$
- symmetry =  $X-\bar{Y}, X, -\bar{Z}$
- symmetry =  $\bar{Y}, -\bar{X}, Z$
- symmetry =  $Y-\bar{X}, Y, Z$
- symmetry =  $X, X-\bar{Y}, Z$
- $\text{asymm} = 0 \leq x \leq 2/3$  and  $0 \leq y \leq 1/3$  and  $0 \leq z \leq 1$  and  $x \leq (1+y)/2$  and  $y \leq x/2$

## 165 P-3c1

- Number of Symmetry Operators = 12
- Space Group Name = P-3c1
- Crystal System = TRIGONAL
- Laue Class =  $\bar{3}m$
- Point Group =  $\bar{3}m$

- Patterson Space Group # = [164](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -Y,X-Y,Z
- symmetry= Y-X,-X,Z
- symmetry= Y,X,1/2-Z
- symmetry= X-Y,-Y,1/2-Z
- symmetry= -X,Y-X,1/2-Z
- symmetry= -X,-Y,-Z
- symmetry= Y,Y-X,-Z
- symmetry= X-Y,X,-Z
- symmetry= -Y,-X,1/2+Z
- symmetry= Y-X,Y,1/2+Z
- symmetry= X,X-Y,1/2+Z
- asymm=  $0 \leq x \leq 2/3$  and  $0 \leq y \leq 2/3$  and  $0 \leq z \leq 1/4$  and  $x \leq (1+y)/2$  and  $y \leq \min(1-x, (1+x)/2)$

## 166 R-3m

- Number of Symmetry Operators = 36
- Space Group Name = R-3m
- Crystal System = TRIGONAL
- Laue Class = -3m
- Point Group = -3m
- Patterson Space Group # = [166](#)
- Lattice Type = R
- symmetry= X,Y,Z
- symmetry= -Y,X-Y,Z
- symmetry= Y-X,-X,Z
- symmetry= Y,X,-Z
- symmetry= X-Y,-Y,-Z
- symmetry= -X,Y-X,-Z
- symmetry= -X,-Y,-Z
- symmetry= Y,Y-X,-Z
- symmetry= X-Y,X,-Z
- symmetry= -Y,-X,Z
- symmetry= Y-X,Y,Z
- symmetry= X,X-Y,Z
- symmetry=  $2/3+X, 1/3+Y, 1/3+Z$
- symmetry=  $2/3-Y, 1/3+X-Y, 1/3+Z$
- symmetry=  $2/3+Y-X, 1/3-X, 1/3+Z$
- symmetry=  $2/3+Y, 1/3+X, 1/3-Z$
- symmetry=  $2/3+X-Y, 1/3-Y, 1/3-Z$
- symmetry=  $2/3-X, 1/3+Y-X, 1/3-Z$
- symmetry=  $2/3-X, 1/3-Y, 1/3-Z$
- symmetry=  $2/3+Y, 1/3+Y-X, 1/3-Z$
- symmetry=  $2/3+X-Y, 1/3+X, 1/3-Z$
- symmetry=  $2/3-Y, 1/3-X, 1/3+Z$
- symmetry=  $2/3+Y-X, 1/3+Y, 1/3+Z$
- symmetry=  $2/3+X, 1/3+X-Y, 1/3+Z$
- symmetry=  $1/3+X, 2/3+Y, 2/3+Z$
- symmetry=  $1/3-Y, 2/3+X-Y, 2/3+Z$
- symmetry=  $1/3+Y-X, 2/3-X, 2/3+Z$
- {\*\*\*}
- symmetry=  $1/3+Y, 2/3+X, 2/3-Z$
- symmetry=  $1/3+X-Y, 2/3-Y, 2/3-Z$
- symmetry=  $1/3-X, 2/3+Y-X, 2/3-Z$
- symmetry=  $1/3-X, 2/3-Y, 2/3-Z$

- symmetry=  $1/3+Y, 2/3+Y-X, 2/3-Z$
- symmetry=  $1/3X-Y, 2/3+X, 2/3-Z$
- symmetry=  $1/3-Y, 2/3-X, 2/3+Z$
- symmetry=  $1/3+Y-X, 2/3+Y, 2/3+Z$
- symmetry=  $1/3+X, 2/3+X-Y, 2/3+Z$
- asymm=  $0 \leq x \leq 2/3$  and  $0 \leq y \leq 2/3$  and  $0 \leq z \leq 1/6$  and  $x \leq 2y$  and  $y \leq \min(1-x, 2x)$

## 167 R-3c

- Number of Symmetry Operators = 36
- Space Group Name = R-3c
- Crystal System = TRIGONAL
- Laue Class =  $\bar{3}m$
- Point Group =  $\bar{3}m$
- Patterson Space Group # = [166](#)
- Lattice Type = R
- symmetry= X,Y,Z
- symmetry=  $-Y, X-Y, Z$
- symmetry=  $Y-X, -X, Z$
- symmetry=  $Y, X, 1/2-Z$
- symmetry=  $X-Y, -Y, 1/2-Z$
- symmetry=  $-X, Y-X, 1/2-Z$
- symmetry=  $-X, -Y, -Z$
- symmetry=  $Y, Y-X, -Z$
- symmetry=  $X-Y, X, -Z$
- symmetry=  $-Y, X, 1/2+Z$
- symmetry=  $Y-X, Y, 1/2+Z$
- symmetry=  $X, X-Y, 1/2+Z$
- symmetry=  $2/3+X, 1/3+Y, 1/3+Z$
- symmetry=  $2/3-Y, 1/3+X-Y, 1/3+Z$
- symmetry=  $2/3+Y-X, 1/3-X, 1/3+Z$
- symmetry=  $2/3+Y, 1/3+X, 5/6-Z$
- symmetry=  $2/3+X-Y, 1/3-Y, 5/6-Z$
- symmetry=  $2/3-X, 1/3+Y-X, 5/6-Z$
- symmetry=  $2/3-X, 1/3-Y, 1/3-Z$
- symmetry=  $2/3+Y, 1/3+Y-X, 1/3-Z$
- symmetry=  $2/3+X-Y, 1/3+X, 1/3-Z$
- symmetry=  $2/3-Y, 1/3-X, 5/6+Z$
- symmetry=  $2/3+Y-X, 1/3+Y, 5/6+Z$
- symmetry=  $2/3+X, 1/3+X-Y, 5/6+Z$
- symmetry=  $1/3+X, 2/3+Y, 2/3+Z$
- symmetry=  $1/3-Y, 2/3+X-Y, 2/3+Z$
- symmetry=  $1/3+Y-X, 2/3-X, 2/3+Z$
- symmetry=  $1/3+Y, 2/3+X, 1/6-Z$
- symmetry=  $1/3+X-Y, 2/3-Y, 1/6-Z$
- symmetry=  $1/3-X, 2/3+Y-X, 1/6-Z$
- symmetry=  $1/3-X, 2/3-Y, 2/3-Z$
- symmetry=  $1/3+Y, 2/3+Y-X, 2/3-Z$
- symmetry=  $1/3+X-Y, 2/3+X, 2/3-Z$
- symmetry=  $1/3-Y, 2/3-X, 1/6+Z$
- symmetry=  $1/3+Y-X, 2/3+Y, 1/6+Z$
- symmetry=  $1/3+X, 2/3+X-Y, 1/6+Z$
- asymm=  $0 \leq x \leq 2/3$  and  $0 \leq y \leq 2/3$  and  $0 \leq z \leq 1/12$  and  $x \leq (1+y)/2$  and  $y \leq \min(1-x, (1+x)/2)$

## 168 P6

- Number of Symmetry Operators = 6
- Space Group Name = P6
- Crystal System = HEXAGONAL
- Laue Class = 6/m
- Point Group = 6
- Patterson Space Group # = [175](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -Y,X-Y,Z
- symmetry= Y-X,-X,Z
- symmetry= -X,-Y,Z
- symmetry= Y,Y-X,Z
- symmetry= X-Y,X,Z
- asymm=  $0 \leq x \leq 2/3$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1$  and  $x \leq (1+y)/2$  and  $y \leq \min(1-x, x)$

## 169 P6(1)

- Number of Symmetry Operators = 6
- Space Group Name = P6(1)
- Crystal System = HEXAGONAL
- Laue Class = 6/m
- Point Group = 6
- Patterson Space Group # = [175](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -Y,X-Y,Z+1/3
- symmetry= Y-X,-X,Z+2/3
- symmetry= -X,-Y,Z+1/2
- symmetry= Y,Y-X,Z+5/6
- symmetry= X-Y,X,Z+1/6
- asymm=  $0 \leq x \leq 1$  and  $0 \leq y \leq 1$  and  $0 \leq z \leq 1/6$

## 170 P6(5)

- Number of Symmetry Operators = 6
- Space Group Name = P6(5)
- Crystal System = HEXAGONAL
- Laue Class = 6/m
- Point Group = 6
- Patterson Space Group # = [175](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -Y,X-Y,Z+2/3
- symmetry= Y-X,-X,Z+1/3
- symmetry= -X,-Y,Z+1/2
- symmetry= Y,Y-X,Z+1/6
- symmetry= X-Y,X,Z+5/6
- asymm=  $0 \leq x \leq 1$  and  $0 \leq y \leq 1$  and  $0 \leq z \leq 1/6$

## 171 P6(2)

- Number of Symmetry Operators = 6
- Space Group Name = P6(2)
- Crystal System = HEXAGONAL
- Laue Class = 6/m

- Point Group = 6
- Patterson Space Group # = [175](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -Y,X-Y,2/3+Z
- symmetry= Y-X,-X,1/3+Z
- symmetry= -X,-Y,Z
- symmetry= Y,Y-X,2/3+Z
- symmetry= X-Y,X,1/3+Z
- asymm=  $0 \leq x \leq 1$  and  $0 \leq y \leq 1$  and  $0 \leq z \leq 1/3$  and  $y \leq x$

## 172 P6(4)

- Number of Symmetry Operators = 6
- Space Group Name = P6(4)
- Crystal System = HEXAGONAL
- Laue Class = 6/m
- Point Group = 6
- Patterson Space Group # = [175](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -Y,X-Y,1/3+Z
- symmetry= Y-X,-X,2/3+Z
- symmetry= -X,-Y,Z
- symmetry= Y,Y-X,1/3+Z
- symmetry= X-Y,X,2/3+Z
- asymm=  $0 \leq x \leq 1$  and  $0 \leq y \leq 1$  and  $0 \leq z \leq 1/3$  and  $y \leq x$

## 173 P6(3)

- Number of Symmetry Operators = 6
- Space Group Name = P6(3)
- Crystal System = HEXAGONAL
- Laue Class = 6/m
- Point Group = 6
- Patterson Space Group # = [175](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -Y,X-Y,Z
- symmetry= Y-X,-X,Z
- symmetry= -X,-Y,1/2+Z
- symmetry= Y,Y-X,1/2+Z
- symmetry= X-Y,X,1/2+Z
- asymm=  $0 \leq x \leq 2/3$  and  $0 \leq y \leq 2/3$  and  $0 \leq z \leq 1/2$  and  $x \leq (1+y)/2$  and  $y \leq \min(1-x, (1+x)/2)$

## 174 P-6

- Number of Symmetry Operators = 6
- Space Group Name = P-6
- Crystal System = HEXAGONAL
- Laue Class = 6/m
- Point Group = -6
- Patterson Space Group # = [175](#)
- Lattice Type = P
- symmetry= X,Y,Z



- symmetry=  $-Y, X-Y, Z$
- symmetry=  $Y-X, -X, Z$
- symmetry=  $X, Y, -Z$
- symmetry=  $-Y, X-Y, -Z$
- symmetry=  $Y-X, -X, -Z$
- asymm=  $0 \leq x \leq 2/3$  and  $0 \leq y \leq 2/3$  and  $0 \leq z \leq 1/2$  and  $x \leq (1+y)/2$  and  $y \leq \min(1-x, (1+x)/2)$

## 175 P6/m

- Number of Symmetry Operators = 12
- Space Group Name = P6/m
- Crystal System = HEXAGONAL
- Laue Class = 6/m
- Point Group = 6/m
- Patterson Space Group # = [175](#)
- Lattice Type = P
- symmetry=  $X, Y, Z$
- symmetry=  $-Y, X-Y, Z$
- symmetry=  $Y-X, -X, Z$
- symmetry=  $-X, -Y, Z$
- symmetry=  $Y, Y-X, Z$
- symmetry=  $X-Y, X, Z$
- symmetry=  $-X, -Y, -Z$
- symmetry=  $Y, Y-X, -Z$
- symmetry=  $X-Y, X, -Z$
- symmetry=  $X, Y, -Z$
- symmetry=  $-Y, X-Y, -Z$
- symmetry=  $Y-X, -X, -Z$
- asymm=  $0 \leq x \leq 2/3$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$  and  $x \leq (1+y)/2$  and  $y \leq \min(1-x, x)$

## 176 P6(3)/m

- Number of Symmetry Operators = 12
- Space Group Name = P6(3)/m
- Crystal System = HEXAGONAL
- Laue Class = 6/m
- Point Group = 6/m
- Patterson Space Group # = [175](#)
- Lattice Type = P
- symmetry=  $X, Y, Z$
- symmetry=  $-Y, X-Y, Z$
- symmetry=  $Y-X, -X, Z$
- symmetry=  $-X, -Y, 1/2+Z$
- symmetry=  $Y, Y-X, 1/2+Z$
- symmetry=  $X-Y, X, 1/2+Z$
- symmetry=  $-X, -Y, -Z$
- symmetry=  $Y, Y-X, -Z$
- symmetry=  $X-Y, X, -Z$
- symmetry=  $X, Y, 1/2-Z$
- symmetry=  $-Y, X-Y, 1/2-Z$
- symmetry=  $Y-X, -X, 1/2-Z$
- asymm=  $0 \leq x \leq 2/3$  and  $0 \leq y \leq 2/3$  and  $0 \leq z \leq 1/4$  and  $x \leq (1+y)/2$  and  $y \leq \min(1-x, (1+x)/2)$

## 177 P622

- Number of Symmetry Operators = 12
- Space Group Name = P622
- Crystal System = HEXAGONAL
- Laue Class = 6/mmm
- Point Group = 622
- Patterson Space Group # = [191](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -Y,X-Y,Z
- symmetry= Y-X,-X,Z
- symmetry= -X,-Y,Z
- symmetry= Y,Y-X,Z
- symmetry= X-Y,X,Z
- symmetry= Y,X,-Z
- symmetry= X-Y,-Y,-Z
- symmetry= -X,Y-X,-Z
- symmetry= -Y,-X,-Z
- symmetry= Y-X,Y,-Z
- symmetry= X,X-Y,-Z
- asymm=  $0 \leq x \leq 2/3$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$  and  $x \leq (1+y)/2$  and  $y \leq \min(1-x, x)$

## 178 P6(1)22

- Number of Symmetry Operators = 12
- Space Group Name = P6(1)22
- Crystal System = HEXAGONAL
- Laue Class = 6/mmm
- Point Group = 622
- Patterson Space Group # = [191](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -Y,X-Y,1/3+Z
- symmetry= Y-X,-X,2/3+Z
- symmetry= -X,-Y,1/2+Z
- symmetry= Y,Y-X,5/6+Z
- symmetry= X-Y,X,1/6+Z
- symmetry= Y,X,1/3-Z
- symmetry= X-Y,-Y,-Z
- symmetry= -X,Y-X,2/3-Z
- symmetry= -Y,-X,5/6-Z
- symmetry= Y-X,Y,1/2-Z
- symmetry= X,X-Y,1/6-Z
- asymm=  $0 \leq x \leq 1$  and  $0 \leq y \leq 1$  and  $0 \leq z \leq 1/12$

## 179 P6(5)22

- Number of Symmetry Operators = 12
- Space Group Name = P6(5)22
- Crystal System = HEXAGONAL
- Laue Class = 6/mmm
- Point Group = 622
- Patterson Space Group # = [191](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -Y,X-Y,2/3+Z
- symmetry= Y-X,-X,1/3+Z

- symmetry=  $-X, -Y, 1/2+Z$
- symmetry=  $Y, Y-X, 1/6+Z$
- symmetry=  $X-Y, X, 5/6+Z$
- symmetry=  $Y, X, 2/3-Z$
- symmetry=  $X-Y, -Y, -Z$
- symmetry=  $-X, Y-X, 1/3-Z$
- symmetry=  $-Y, -X, 1/6-Z$
- symmetry=  $Y-X, Y, 1/2-Z$
- symmetry=  $X, X-Y, 5/6-Z$
- asymm=  $0 \leq x \leq 1$  and  $0 \leq y \leq 1$  and  $0 \leq z \leq 1/12$

## 180 P6(2)22

- Number of Symmetry Operators = 12
- Space Group Name = P6(2)22
- Crystal System = HEXAGONAL
- Laue Class = 6/mmm
- Point Group = 622
- Patterson Space Group # = [191](#)
- Lattice Type = P
- symmetry=  $X, Y, Z$
- symmetry=  $-Y, X-Y, 2/3+Z$
- symmetry=  $Y-X, -X, 1/3+Z$
- symmetry=  $-X, -Y, Z$
- symmetry=  $Y, Y-X, 2/3+Z$
- symmetry=  $X-Y, X, 1/3+Z$
- symmetry=  $Y, X, 2/3-Z$
- symmetry=  $X-Y, -Y, -Z$
- symmetry=  $-X, Y-X, 1/3-Z$
- symmetry=  $-Y, -X, 2/3-Z$
- symmetry=  $Y-X, Y, -Z$
- symmetry=  $X, X-Y, 1/3-Z$
- asymm=  $0 \leq x \leq 1$  and  $0 \leq y \leq 1$  and  $0 \leq z \leq 1/6$  and  $y \leq x$

## 181 P6(4)22

- Number of Symmetry Operators = 12
- Space Group Name = P6(4)22
- Crystal System = HEXAGONAL
- Laue Class = 6/mmm
- Point Group = 622
- Patterson Space Group # = [191](#)
- Lattice Type = P
- symmetry=  $X, Y, Z$
- symmetry=  $-Y, X-Y, 1/3+Z$
- symmetry=  $Y-X, -X, 2/3+Z$
- symmetry=  $-X, -Y, Z$
- symmetry=  $Y, Y-X, 1/3+Z$
- symmetry=  $X-Y, X, 2/3+Z$
- symmetry=  $Y, X, 1/3-Z$
- symmetry=  $X-Y, -Y, -Z$
- symmetry=  $-X, Y-X, 2/3-Z$
- symmetry=  $-Y, -X, 1/3-Z$
- symmetry=  $Y-X, Y, -Z$
- symmetry=  $X, X-Y, 2/3-Z$
- asymm=  $0 \leq x \leq 1$  and  $0 \leq y \leq 1$  and  $0 \leq z \leq 1/6$  and  $y \leq x$

## 182 P6(3)22

- Number of Symmetry Operators = 12
- Space Group Name = P6(3)22
- Crystal System = HEXAGONAL
- Laue Class = 6/mmm
- Point Group = 622
- Patterson Space Group # = [191](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -Y,X-Y,Z
- symmetry= Y-X,-X,Z
- symmetry= -X,-Y,1/2+Z
- symmetry= Y,Y-X,1/2+Z
- symmetry= X-Y,X,1/2+Z
- symmetry= Y,X,-Z
- symmetry= X-Y,-Y,-Z
- symmetry= -X,Y-X,-Z
- symmetry= -Y,X,1/2-Z
- symmetry= Y-X,Y,1/2-Z
- symmetry= X,X-Y,1/2-Z
- asymm=  $0 \leq x \leq 2/3$  and  $0 \leq y \leq 2/3$  and  $0 \leq z \leq 1/4$  and  $x \leq (1+y)/2$  and  $y \leq \min(1-x, (1+x)/2)$

## 183 P6mm

- Number of Symmetry Operators = 12
- Space Group Name = P6mm
- Crystal System = HEXAGONAL
- Laue Class = 6/mmm
- Point Group = 6mm
- Patterson Space Group # = [191](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -Y,X-Y,Z
- symmetry= Y-X,-X,Z
- symmetry= -X,-Y,Z
- symmetry= Y,Y-X,Z
- symmetry= X-Y,X,Z
- symmetry= -Y,-X,Z
- symmetry= Y-X,Y,Z
- symmetry= X,X-Y,Z
- symmetry= Y,X,Z
- symmetry= X-Y,-Y,Z
- symmetry= -X,Y-X,Z
- asymm=  $0 \leq x \leq 2/3$  and  $0 \leq y \leq 1/3$  and  $0 \leq z \leq 1$  and  $x \leq (1+y)/2$  and  $y \leq x/2$

## 184 P6cc

- Number of Symmetry Operators = 12
- Space Group Name = P6cc
- Crystal System = HEXAGONAL
- Laue Class = 6/mmm
- Point Group = 6mm
- Patterson Space Group # = [191](#)
- Lattice Type = P
- symmetry= X,Y,Z

- symmetry=  $-Y, X-Y, Z$
- symmetry=  $Y-X, -X, Z$
- symmetry=  $-X, -Y, Z$
- symmetry=  $Y, Y-X, Z$
- symmetry=  $X-Y, X, Z$
- symmetry=  $-Y, -X, 1/2+Z$
- symmetry=  $Y-X, Y, 1/2+Z$
- symmetry=  $X, X-Y, 1/2+Z$
- symmetry=  $Y, X, 1/2+Z$
- symmetry=  $X-Y, -Y, 1/2+Z$
- symmetry=  $-X, Y-X, 1/2+Z$
- asymm=  $0 \leq x \leq 2/3$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$  and  $x \leq (1+y)/2$  and  $y \leq \min(1-x, x)$

## 185 P6(3)cm

- Number of Symmetry Operators = 12
- Space Group Name = P6(3)cm
- Crystal System = HEXAGONAL
- Laue Class = 6/mmm
- Point Group = 6mm
- Patterson Space Group # = [191](#)
- Lattice Type = P
- symmetry=  $X, Y, Z$
- symmetry=  $-Y, X-Y, Z$
- symmetry=  $Y-X, -X, Z$
- symmetry=  $-X, -Y, 1/2+Z$
- symmetry=  $Y, Y-X, 1/2+Z$
- symmetry=  $X-Y, X, 1/2+Z$
- symmetry=  $-Y, -X, 1/2+Z$
- symmetry=  $Y-X, Y, 1/2+Z$
- symmetry=  $X, X-Y, 1/2+Z$
- symmetry=  $Y, X, Z$
- symmetry=  $X-Y, -Y, Z$
- symmetry=  $-X, Y-X, Z$
- asymm=  $0 \leq x \leq 2/3$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$  and  $x \leq (1+y)/2$  and  $y \leq \min(1-x, x)$

## 186 P6(3)mc

- Number of Symmetry Operators = 12
- Space Group Name = P6(3)mc
- Crystal System = HEXAGONAL
- Laue Class = 6/mmm
- Point Group = 6mm
- Patterson Space Group # = [191](#)
- Lattice Type = P
- symmetry=  $X, Y, Z$
- symmetry=  $-Y, X-Y, Z$
- symmetry=  $Y-X, -X, Z$
- symmetry=  $-X, -Y, 1/2+Z$
- symmetry=  $Y, Y-X, 1/2+Z$
- symmetry=  $X-Y, X, 1/2+Z$
- symmetry=  $-Y, -X, Z$
- symmetry=  $Y-X, Y, Z$
- symmetry=  $X, X-Y, Z$
- symmetry=  $Y, X, 1/2+Z$
- symmetry=  $X-Y, -Y, 1/2+Z$

- symmetry=  $-X, Y-X, 1/2+Z$
- asymm=  $0 \leq x \leq 2/3$  and  $0 \leq y \leq 1/3$  and  $0 \leq z \leq 1$  and  $x \leq (1+y)/2$  and  $y \leq x/2$

## 187 P-6m2

- Number of Symmetry Operators = 12
- Space Group Name = P-6m2
- Crystal System = HEXAGONAL
- Laue Class = 6/mmm
- Point Group = -62m
- Patterson Space Group # = [191](#)
- Lattice Type = P
- symmetry=  $X, Y, Z$
- symmetry=  $-Y, X-Y, Z$
- symmetry=  $Y-X, -X, Z$
- symmetry=  $X, Y, -Z$
- symmetry=  $-Y, X-Y, -Z$
- symmetry=  $Y-X, -X, -Z$
- symmetry=  $-Y, -X, Z$
- symmetry=  $Y-X, Y, Z$
- symmetry=  $X, X-Y, Z$
- symmetry=  $-Y, -X, -Z$
- symmetry=  $Y-X, Y, -Z$
- symmetry=  $X, X-Y, -Z$
- asymm=  $0 \leq x \leq 2/3$  and  $0 \leq y \leq 2/3$  and  $0 \leq z \leq 1/2$  and  $x \leq 2y$  and  $y \leq \min(1-x, 2x)$

## 188 P-6c2

- Number of Symmetry Operators = 12
- Space Group Name = P-6c2
- Crystal System = HEXAGONAL
- Laue Class = 6/mmm
- Point Group = -62m
- Patterson Space Group # = [191](#)
- Lattice Type = P
- symmetry=  $X, Y, Z$
- symmetry=  $-Y, X-Y, Z$
- symmetry=  $Y-X, -X, Z$
- symmetry=  $X, Y, 1/2-Z$
- symmetry=  $-Y, X-Y, 1/2-Z$
- symmetry=  $Y-X, -X, 1/2-Z$
- symmetry=  $-Y, -X, 1/2+Z$
- symmetry=  $Y-X, Y, 1/2+Z$
- symmetry=  $X, X-Y, 1/2+Z$
- symmetry=  $-Y, -X, -Z$
- symmetry=  $Y-X, Y, -Z$
- symmetry=  $X, X-Y, -Z$
- asymm=  $0 \leq x \leq 2/3$  and  $0 \leq y \leq 2/3$  and  $0 \leq z \leq 1/4$  and  $x \leq (1+y)/2$  and  $y \leq \min(1-x, (1+x)/2)$

## 189 P-62m

- Number of Symmetry Operators = 12
- Space Group Name = P-62m
- Crystal System = HEXAGONAL
- Laue Class = 6/mmm

- Point Group =  $\bar{6}2m$
- Patterson Space Group # = [191](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry=  $\bar{Y},X\bar{Y},Z$
- symmetry=  $Y\bar{X},\bar{X},Z$
- symmetry= X,Y, $\bar{Z}$
- symmetry=  $\bar{Y},X\bar{Y},\bar{Z}$
- symmetry=  $Y\bar{X},\bar{X},\bar{Z}$
- symmetry= Y,X, $\bar{Z}$
- symmetry=  $X\bar{Y},\bar{Y},\bar{Z}$
- symmetry=  $\bar{X},Y\bar{X},\bar{Z}$
- symmetry= Y,X,Z
- symmetry=  $X\bar{Y},\bar{Y},Z$
- symmetry=  $\bar{X},Y\bar{X},Z$
- asymm=  $0 \leq x \leq 2/3$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$  and  $x \leq (1+y)/2$  and  $y \leq \min(1-x, x)$

## 190 P-62c

- Number of Symmetry Operators = 12
- Space Group Name = P-62c
- Crystal System = HEXAGONAL
- Laue Class = 6/mmm
- Point Group =  $\bar{6}2m$
- Patterson Space Group # = [191](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry=  $\bar{Y},X\bar{Y},Z$
- symmetry=  $Y\bar{X},\bar{X},Z$
- symmetry= X,Y, $1/2\bar{Z}$
- symmetry=  $\bar{Y},X\bar{Y},1/2\bar{Z}$
- symmetry=  $Y\bar{X},\bar{X},1/2\bar{Z}$
- symmetry= Y,X, $\bar{Z}$
- symmetry=  $X\bar{Y},\bar{Y},\bar{Z}$
- symmetry=  $\bar{X},Y\bar{X},\bar{Z}$
- symmetry= Y,X, $1/2+Z$
- symmetry=  $X\bar{Y},\bar{Y},1/2+Z$
- symmetry=  $\bar{X},Y\bar{X},1/2+Z$
- asymm=  $0 \leq x \leq 2/3$  and  $0 \leq y \leq 2/3$  and  $0 \leq z \leq 1/4$  and  $x \leq (1+y)/2$  and  $y \leq \min(1-x, (1+x)/2)$

## 191 P6/mmm

- Number of Symmetry Operators = 24
- Space Group Name = P6/mmm
- Crystal System = HEXAGONAL
- Laue Class = 6/mmm
- Point Group = 6/mmm
- Patterson Space Group # = [191](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry=  $\bar{Y},X\bar{Y},Z$
- symmetry=  $Y\bar{X},\bar{X},Z$
- symmetry=  $\bar{X},\bar{Y},Z$
- symmetry= Y,Y,X,Z
- symmetry=  $X\bar{Y},X,Z$
- symmetry= Y,X, $\bar{Z}$

- symmetry= X-Y,-Y,-Z
- symmetry= -X,Y-X,-Z
- symmetry= -Y,-X,-Z
- symmetry= Y-X,Y,-Z
- symmetry= X,X-Y,-Z
- symmetry= -X,-Y,-Z
- symmetry= Y,Y-X,-Z
- symmetry= X-Y,X,-Z
- symmetry= X,Y,-Z
- symmetry= Y-X,-X,-Z
- symmetry= -Y,X-Y,-Z
- symmetry= -Y,-X,Z
- symmetry= Y-X,Y,Z
- symmetry= X,X-Y,Z
- symmetry= Y,X,Z
- symmetry= X-Y,-Y,Z
- symmetry= -X,Y-X,Z
- asymm=  $0 \leq x \leq 2/3$  and  $0 \leq y \leq 1/3$  and  $0 \leq z \leq 1/2$  and  $x \leq (1+y)/2$  and  $y \leq x/2$

## 192 P6/mcc

- Number of Symmetry Operators = 24
- Space Group Name = P6/mcc
- Crystal System = HEXAGONAL
- Laue Class = 6/mmm
- Point Group = 6/mmm
- Patterson Space Group # = [191](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -Y,X-Y,Z
- symmetry= Y-X,-X,Z
- symmetry= -X,-Y,Z
- symmetry= Y,Y-X,Z
- symmetry= X-Y,X,Z
- symmetry= Y,X,1/2-Z
- symmetry= X-Y,-Y,1/2-Z
- symmetry= -X,Y-X,1/2-Z
- symmetry= -Y,-X,1/2-Z
- symmetry= Y-X,Y,1/2-Z
- symmetry= X,X-Y,1/2-Z
- symmetry= -X,-Y,-Z
- symmetry= Y,Y-X,-Z
- symmetry= X-Y,X,-Z
- symmetry= X,Y,-Z
- symmetry= Y-X,-X,-Z
- symmetry= -Y,X-Y,-Z
- symmetry= -Y,-X,1/2+Z
- symmetry= Y-X,Y,1/2+Z
- symmetry= X,X-Y,1/2+Z
- symmetry= Y,X,1/2+Z
- symmetry= X-Y,-Y,1/2+Z
- symmetry= -X,Y-X,1/2+Z
- asymm=  $0 \leq x \leq 2/3$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/4$  and  $x \leq (1+y)/2$  and  $y \leq \min(1-x, x)$

## 193 P6(3)/mcm



- Number of Symmetry Operators = 24
- Space Group Name = P6(3)/mcm
- Crystal System = HEXAGONAL
- Laue Class = 6/mmm
- Point Group = 6/mmm
- Patterson Space Group # = [191](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -Y,X-Y,Z
- symmetry= Y-X,-X,Z
- symmetry= -X,-Y,1/2+Z
- symmetry= Y,Y-X,1/2+Z
- symmetry= X-Y,X,1/2+Z
- symmetry= Y,X,1/2-Z
- symmetry= X-Y,-Y,1/2-Z
- symmetry= -X,Y-X,1/2-Z
- symmetry= -Y,-X,-Z
- symmetry= Y-X,Y,-Z
- symmetry= X,X-Y,-Z
- symmetry= -X,-Y,-Z
- symmetry= Y,Y-X,-Z
- symmetry= X-Y,X,-Z
- symmetry= X,Y,1/2-Z
- symmetry= Y-X,-X,1/2-Z
- symmetry= -Y,X-Y,1/2-Z
- symmetry= -Y,-X,1/2+Z
- symmetry= Y-X,Y,1/2+Z
- symmetry= X,X-Y,1/2+Z
- symmetry= Y,X,Z
- symmetry= X-Y,-Y,Z
- symmetry= -X,Y-X,Z
- asymm=  $0 \leq x \leq 2/3$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/4$  and  $x \leq (1+y)/2$  and  $y \leq \min(1-x, x)$

## 194 P6(3)/mmc

- Number of Symmetry Operators = 24
- Space Group Name = P6(3)/mmc
- Crystal System = HEXAGONAL
- Laue Class = 6/mmm
- Point Group = 6/mmm
- Patterson Space Group # = [191](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -Y,X-Y,Z
- symmetry= Y-X,-X,Z
- symmetry= -X,-Y,1/2+Z
- symmetry= Y,Y-X,1/2+Z
- symmetry= X-Y,X,1/2+Z
- symmetry= Y,X,-Z
- symmetry= X-Y,-Y,-Z
- symmetry= -X,Y-X,-Z
- symmetry= -Y,-X,1/2-Z
- symmetry= Y-X,Y,1/2-Z
- symmetry= X,X-Y,1/2-Z
- symmetry= -X,-Y,-Z
- symmetry= Y,Y-X,-Z
- symmetry= X-Y,X,-Z

- symmetry=  $X, Y, 1/2-Z$
- symmetry=  $Y-X, -X, 1/2-Z$
- symmetry=  $-Y, X-Y, 1/2-Z$
- symmetry=  $-Y, -X, Z$
- symmetry=  $Y-X, Y, Z$
- symmetry=  $X, X-Y, Z$
- symmetry=  $Y, X, 1/2+Z$
- symmetry=  $X-Y, -Y, 1/2+Z$
- symmetry=  $-X, Y-X, 1/2+Z$
- asymm=  $0 < x < 2/3$  and  $0 < y < 2/3$  and  $0 < z < 1/4$  and  $x < 2y$  and  $y < \min(1-x, 2x)$

## 195 P23

- Number of Symmetry Operators = 12
- Space Group Name = P23
- Crystal System = CUBIC
- Laue Class =  $m-3$
- Point Group = 23
- Patterson Space Group # = [200](#)
- Lattice Type = P
- symmetry=  $X, Y, Z$
- symmetry=  $-X, -Y, Z$
- symmetry=  $-X, Y, -Z$
- symmetry=  $X, -Y, -Z$
- symmetry=  $Z, X, Y$
- symmetry=  $Z, -X, -Y$
- symmetry=  $-Z, -X, Y$
- symmetry=  $-Z, X, -Y$
- symmetry=  $Y, Z, X$
- symmetry=  $-Y, Z, -X$
- symmetry=  $Y, -Z, -X$
- symmetry=  $-Y, -Z, X$
- asymm=  $0 < x < 1$  and  $0 < y < 1$  and  $0 < z < 1/2$  and  $y < 1-x$  and  $z < \min(x, y)$

## 196 F23

- Number of Symmetry Operators = 48
- Space Group Name = F23
- Crystal System = CUBIC
- Laue Class =  $m-3$
- Point Group = 23
- Patterson Space Group # = [202](#)
- Lattice Type = F
- symmetry=  $X, Y, Z$
- symmetry=  $-X, -Y, Z$
- symmetry=  $-X, Y, -Z$
- symmetry=  $X, -Y, -Z$
- symmetry=  $Z, X, Y$
- symmetry=  $Z, -X, -Y$
- symmetry=  $-Z, -X, Y$
- symmetry=  $-Z, X, -Y$
- symmetry=  $Y, Z, X$
- symmetry=  $-Y, Z, -X$
- symmetry=  $Y, -Z, -X$
- symmetry=  $-Y, -Z, X$
- symmetry=  $X, 1/2+Y, 1/2+Z$

- symmetry=  $-X, 1/2-Y, 1/2+Z$
- symmetry=  $-X, 1/2+Y, 1/2-Z$
- symmetry=  $X, 1/2-Y, 1/2-Z$
- symmetry=  $Z, 1/2+X, 1/2+Y$
- symmetry=  $Z, 1/2-X, 1/2-Y$
- symmetry=  $-Z, 1/2-X, 1/2+Y$
- symmetry=  $-Z, 1/2+X, 1/2-Y$
- symmetry=  $Y, 1/2+Z, 1/2+X$
- symmetry=  $-Y, 1/2+Z, 1/2-X$
- symmetry=  $Y, 1/2-Z, 1/2-X$
- symmetry=  $-Y, 1/2-Z, 1/2+X$
- symmetry=  $1/2+X, Y, 1/2+Z$
- symmetry=  $1/2-X, -Y, 1/2+Z$
- symmetry=  $1/2-X, Y, 1/2-Z$
- symmetry=  $1/2+X, -Y, 1/2-Z$
- symmetry=  $1/2+Z, X, 1/2+Y$
- symmetry=  $1/2+Z, -X, 1/2-Y$
- symmetry=  $1/2-Z, -X, 1/2+Y$
- symmetry=  $1/2-Z, X, 1/2-Y$
- symmetry=  $1/2+Y, Z, 1/2+X$
- symmetry=  $1/2-Y, Z, 1/2-X$
- symmetry=  $1/2+Y, -Z, 1/2-X$
- symmetry=  $1/2-Y, -Z, 1/2+X$
- symmetry=  $1/2+X, 1/2+Y, Z$
- symmetry=  $1/2-X, 1/2-Y, Z$
- symmetry=  $1/2-X, 1/2+Y, -Z$
- symmetry=  $1/2+X, 1/2-Y, -Z$
- symmetry=  $1/2+Z, 1/2+X, Y$
- symmetry=  $1/2+Z, 1/2-X, -Y$
- symmetry=  $1/2-Z, 1/2-X, Y$
- symmetry=  $1/2-Z, 1/2+X, -Y$
- symmetry=  $1/2+Y, 1/2+Z, X$
- symmetry=  $1/2-Y, 1/2+Z, -X$
- symmetry=  $1/2+Y, 1/2-Z, -X$
- symmetry=  $1/2-Y, 1/2-Z, X$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $-1/4 \leq z \leq 1/4$  and  $y \leq x$  and  $\max(x-1/2, -y) \leq z \leq \min(1/2-x, y)$

## 197 I23

- Number of Symmetry Operators = 24
- Space Group Name = I23
- Crystal System = CUBIC
- Laue Class = m-3
- Point Group = 23
- Patterson Space Group # = [204](#)
- Lattice Type = I
- symmetry=  $X, Y, Z$
- symmetry=  $-X, -Y, Z$
- symmetry=  $-X, Y, -Z$
- symmetry=  $X, -Y, -Z$
- symmetry=  $Z, X, Y$
- symmetry=  $Z, -X, -Y$
- symmetry=  $-Z, -X, Y$
- symmetry=  $-Z, X, -Y$
- symmetry=  $Y, Z, X$
- symmetry=  $-Y, Z, -X$
- symmetry=  $Y, -Z, -X$

- symmetry=  $-Y, -Z, X$
- symmetry=  $1/2+X, 1/2+Y, 1/2+Z$
- symmetry=  $1/2-X, 1/2-Y, 1/2+Z$
- symmetry=  $1/2-X, 1/2+Y, 1/2-Z$
- symmetry=  $1/2+X, 1/2-Y, 1/2-Z$
- symmetry=  $1/2+Z, 1/2+X, 1/2+Y$
- symmetry=  $1/2+Z, 1/2-X, 1/2-Y$
- symmetry=  $1/2-Z, 1/2-X, 1/2+Y$
- symmetry=  $1/2-Z, 1/2+X, 1/2-Y$
- symmetry=  $1/2+Y, 1/2+Z, 1/2+X$
- symmetry=  $1/2-Y, 1/2+Z, 1/2-X$
- symmetry=  $1/2+Y, 1/2-Z, 1/2-X$
- symmetry=  $1/2-Y, 1/2-Z, 1/2+X$
- asymm=  $0 \leq x \leq 1$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$  and  $y \leq \min(x, 1-x)$  and  $z \leq y$

## 198 P2(1)3

- Number of Symmetry Operators = 12
- Space Group Name = P2(1)3
- Crystal System = CUBIC
- Laue Class =  $m\bar{3}$
- Point Group = 23
- Patterson Space Group # = [200](#)
- Lattice Type = P
- symmetry=  $X, Y, Z$
- symmetry=  $1/2-X, -Y, 1/2+Z$
- symmetry=  $-X, 1/2+Y, 1/2-Z$
- symmetry=  $1/2+X, 1/2-Y, -Z$
- symmetry=  $Z, X, Y$
- symmetry=  $1/2+Z, 1/2-X, -Y$
- symmetry=  $1/2-Z, -X, 1/2+Y$
- symmetry=  $-Z, 1/2+X, 1/2-Y$
- symmetry=  $Y, Z, X$
- symmetry=  $-Y, 1/2+Z, 1/2-X$
- symmetry=  $1/2+Y, 1/2-Z, -X$
- symmetry=  $1/2-Y, -Z, 1/2+X$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $-1/2 \leq z \leq 1/2$  and  $\max(x-1/2, -y) \leq z \leq \min(x, y)$

## 199 I2(1)3

- Number of Symmetry Operators = 24
- Space Group Name = I2(1)3
- Crystal System = CUBIC
- Laue Class =  $m\bar{3}$
- Point Group = 23
- Patterson Space Group # = [204](#)
- Lattice Type = I
- symmetry=  $X, Y, Z$
- symmetry=  $1/2-X, -Y, 1/2+Z$
- symmetry=  $-X, 1/2+Y, 1/2-Z$
- symmetry=  $1/2+X, 1/2-Y, -Z$
- symmetry=  $Z, X, Y$
- symmetry=  $1/2+Z, 1/2-X, -Y$
- symmetry=  $1/2-Z, -X, 1/2+Y$
- symmetry=  $-Z, 1/2+X, 1/2-Y$
- symmetry=  $Y, Z, X$

- symmetry=  $-Y, 1/2+Z, 1/2-X$
- symmetry=  $1/2+Y, 1/2-Z, -X$
- symmetry=  $1/2-Y, -Z, 1/2+X$
- symmetry=  $1/2+X, 1/2+Y, 1/2+Z$
- symmetry=  $-X, 1/2-Y, Z$
- symmetry=  $1/2-X, Y, -Z$
- symmetry=  $X, -Y, 1/2-Z$
- symmetry=  $1/2+Z, 1/2+X, 1/2+Y$
- symmetry=  $Z, -X, 1/2-Y$
- symmetry=  $-Z, 1/2-X, Y$
- symmetry=  $1/2-Z, X, -Y$
- symmetry=  $1/2+Y, 1/2+Z, 1/2+X$
- symmetry=  $1/2-Y, Z, -X$
- symmetry=  $Y, -Z, 1/2-X$
- symmetry=  $-Y, 1/2-Z, X$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$  and  $z \leq \min(x, y)$

## 200 Pm-3

- Number of Symmetry Operators = 24
- Space Group Name = Pm-3
- Crystal System = CUBIC
- Laue Class = m-3
- Point Group = m-3
- Patterson Space Group # = [200](#)
- Lattice Type = P
- symmetry=  $X, Y, Z$
- symmetry=  $-X, -Y, Z$
- symmetry=  $-X, Y, -Z$
- symmetry=  $X, -Y, -Z$
- symmetry=  $Z, X, Y$
- symmetry=  $Z, -X, -Y$
- symmetry=  $-Z, -X, Y$
- symmetry=  $-Z, X, -Y$
- symmetry=  $Y, Z, X$
- symmetry=  $-Y, Z, -X$
- symmetry=  $Y, -Z, -X$
- symmetry=  $-Y, -Z, X$
- symmetry=  $-X, -Y, -Z$
- symmetry=  $X, Y, -Z$
- symmetry=  $X, -Y, Z$
- symmetry=  $-X, Y, Z$
- symmetry=  $-Z, -X, -Y$
- symmetry=  $-Z, X, Y$
- symmetry=  $Z, X, -Y$
- symmetry=  $Z, -X, Y$
- symmetry=  $-Y, -Z, -X$
- symmetry=  $Y, -Z, X$
- symmetry=  $-Y, Z, X$
- symmetry=  $Y, Z, -X$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$  and  $z \leq \min(x, y)$

## 201 Pn-3

- Number of Symmetry Operators = 24
- Space Group Name = Pn-3

- Crystal System = CUBIC
- Laue Class = m-3
- Point Group = m-3
- Patterson Space Group # = [200](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= -X,Y,-Z
- symmetry= X,-Y,-Z
- symmetry= Z,X,Y
- symmetry= Z,-X,-Y
- symmetry= -Z,-X,Y
- symmetry= -Z,X,-Y
- symmetry= Y,Z,X
- symmetry= -Y,Z,-X
- symmetry= Y,-Z,-X
- symmetry= -Y,-Z,X
- symmetry= 1/2-X,1/2-Y,1/2-Z
- symmetry= 1/2+X,1/2+Y,1/2-Z
- symmetry= 1/2+X,1/2-Y,1/2+Z
- symmetry= 1/2-X,1/2+Y,1/2+Z
- symmetry= 1/2-Z,1/2-X,1/2-Y
- symmetry= 1/2-Z,1/2+X,1/2+Y
- symmetry= 1/2+Z,1/2+X,1/2-Y
- symmetry= 1/2+Z,1/2-X,1/2+Y
- symmetry= 1/2-Y,1/2-Z,1/2-X
- symmetry= 1/2+Y,1/2-Z,1/2+X
- symmetry= 1/2-Y,1/2+Z,1/2+X
- symmetry= 1/2+Y,1/2+Z,1/2-X
- asymm=  $0 \leq x \leq 1$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$  and  $y \leq \min(x, 1-x)$  and  $z \leq y$

## 202 Fm-3

- Number of Symmetry Operators = 96
- Space Group Name = Fm-3
- Crystal System = CUBIC
- Laue Class = m-3
- Point Group = m-3
- Patterson Space Group # = [202](#)
- Lattice Type = F
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= -X,Y,-Z
- symmetry= X,-Y,-Z
- symmetry= Z,X,Y
- symmetry= Z,-X,-Y
- symmetry= -Z,-X,Y
- symmetry= -Z,X,-Y
- symmetry= Y,Z,X
- symmetry= -Y,Z,-X
- symmetry= Y,-Z,-X
- symmetry= -Y,-Z,X
- symmetry= -X,-Y,-Z
- symmetry= X,Y,-Z
- symmetry= X,-Y,Z
- symmetry= -X,Y,Z
- symmetry= -Z,-X,-Y

- symmetry=  $-Z, X, Y$
- symmetry=  $Z, X, -Y$
- symmetry=  $Z, -X, Y$
- symmetry=  $-Y, -Z, -X$
- symmetry=  $Y, -Z, X$
- symmetry=  $-Y, Z, X$
- symmetry=  $Y, Z, -X$
- symmetry=  $X, 1/2 + Y, 1/2 + Z$
- symmetry=  $-X, 1/2 - Y, 1/2 + Z$
- symmetry=  $-X, 1/2 + Y, 1/2 - Z$
- symmetry=  $X, 1/2 - Y, 1/2 - Z$
- symmetry=  $Z, 1/2 + X, 1/2 + Y$
- symmetry=  $Z, 1/2 - X, 1/2 - Y$
- symmetry=  $-Z, 1/2 - X, 1/2 + Y$
- symmetry=  $-Z, 1/2 + X, 1/2 - Y$
- symmetry=  $Y, 1/2 + Z, 1/2 + X$
- symmetry=  $-Y, 1/2 + Z, 1/2 - X$
- symmetry=  $Y, 1/2 - Z, 1/2 - X$
- symmetry=  $-Y, 1/2 - Z, 1/2 + X$
- symmetry=  $-X, 1/2 - Y, 1/2 - Z$
- symmetry=  $X, 1/2 + Y, 1/2 - Z$
- symmetry=  $X, 1/2 - Y, 1/2 + Z$
- symmetry=  $-X, 1/2 + Y, 1/2 + Z$
- symmetry=  $-Z, 1/2 - X, 1/2 - Y$
- symmetry=  $-Z, 1/2 + X, 1/2 + Y$
- symmetry=  $Z, 1/2 + X, 1/2 - Y$
- symmetry=  $Z, 1/2 - X, 1/2 + Y$
- symmetry=  $-Y, 1/2 - Z, 1/2 - X$
- symmetry=  $Y, 1/2 - Z, 1/2 + X$
- symmetry=  $-Y, 1/2 + Z, 1/2 + X$
- symmetry=  $Y, 1/2 + Z, 1/2 - X$
- symmetry=  $1/2 + X, Y, 1/2 + Z$
- symmetry=  $1/2 - X, -Y, 1/2 + Z$
- symmetry=  $1/2 - X, Y, 1/2 - Z$
- symmetry=  $1/2 + X, -Y, 1/2 - Z$
- symmetry=  $1/2 + Z, X, 1/2 + Y$
- symmetry=  $1/2 + Z, -X, 1/2 - Y$
- symmetry=  $1/2 - Z, -X, 1/2 + Y$
- symmetry=  $1/2 - Z, X, 1/2 - Y$
- symmetry=  $1/2 + Y, Z, 1/2 + X$
- symmetry=  $1/2 - Y, Z, 1/2 - X$
- symmetry=  $1/2 - Y, -Z, 1/2 + X$
- symmetry=  $1/2 - X, -Y, 1/2 - Z$
- symmetry=  $1/2 + X, Y, 1/2 - Z$
- symmetry=  $1/2 + X, -Y, 1/2 + Z$
- symmetry=  $1/2 - X, Y, 1/2 + Z$
- symmetry=  $1/2 - Z, -X, 1/2 - Y$
- symmetry=  $1/2 - Z, X, 1/2 + Y$
- symmetry=  $1/2 + Z, X, 1/2 - Y$
- symmetry=  $1/2 + Z, -X, 1/2 + Y$
- symmetry=  $1/2 - Y, -Z, 1/2 - X$
- symmetry=  $1/2 + Y, -Z, 1/2 + X$
- symmetry=  $1/2 - Y, Z, 1/2 + X$
- symmetry=  $1/2 + Y, Z, 1/2 - X$
- symmetry=  $1/2 + X, 1/2 + Y, Z$
- symmetry=  $1/2 - X, 1/2 - Y, Z$
- symmetry=  $1/2 - X, 1/2 + Y, -Z$

- symmetry=  $1/2+X, 1/2-Y, -Z$
- symmetry=  $1/2+Z, 1/2+X, Y$
- symmetry=  $1/2+Z, 1/2-X, -Y$
- symmetry=  $1/2-Z, 1/2-X, Y$
- symmetry=  $1/2-Z, 1/2+X, -Y$
- symmetry=  $1/2+Y, 1/2+Z, X$
- symmetry=  $1/2-Y, 1/2+Z, -X$
- symmetry=  $1/2+Y, 1/2-Z, -X$
- symmetry=  $1/2-Y, 1/2-Z, X$
- symmetry=  $1/2-X, 1/2-Y, -Z$
- symmetry=  $1/2+X, 1/2+Y, -Z$
- symmetry=  $1/2+X, 1/2-Y, Z$
- symmetry=  $1/2-X, 1/2+Y, Z$
- symmetry=  $1/2-Z, 1/2-X, -Y$
- symmetry=  $1/2-Z, 1/2+X, Y$
- symmetry=  $1/2+Z, 1/2+X, -Y$
- symmetry=  $1/2+Z, 1/2-X, Y$
- symmetry=  $1/2-Y, 1/2-Z, -X$
- symmetry=  $1/2+Y, 1/2-Z, X$
- symmetry=  $1/2-Y, 1/2+Z, X$
- symmetry=  $1/2+Y, 1/2+Z, -X$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/4$  and  $y \leq x$  and  $z \leq \min(1/2-x, y)$

## 203 Fd-3

- Number of Symmetry Operators = 96
- Space Group Name = Fd-3
- Crystal System = CUBIC
- Laue Class = m-3
- Point Group = m-3
- Patterson Space Group # = [202](#)
- Lattice Type = F
- symmetry=  $X, Y, Z$
- symmetry=  $-X, -Y, Z$
- symmetry=  $-X, Y, -Z$
- symmetry=  $X, -Y, -Z$
- symmetry=  $Z, X, Y$
- symmetry=  $Z, -X, -Y$
- symmetry=  $-Z, -X, Y$
- symmetry=  $-Z, X, -Y$
- symmetry=  $Y, Z, X$
- symmetry=  $-Y, Z, -X$
- symmetry=  $Y, -Z, -X$
- symmetry=  $-Y, -Z, X$
- symmetry=  $1/4-X, 1/4-Y, 1/4-Z$
- symmetry=  $1/4+X, 1/4+Y, 1/4-Z$
- symmetry=  $1/4+X, 1/4-Y, 1/4+Z$
- symmetry=  $1/4-X, 1/4+Y, 1/4+Z$
- symmetry=  $1/4-Z, 1/4-X, 1/4-Y$
- symmetry=  $1/4-Z, 1/4+X, 1/4+Y$
- symmetry=  $1/4+Z, 1/4+X, 1/4-Y$
- symmetry=  $1/4+Z, 1/4-X, 1/4+Y$
- symmetry=  $1/4-Y, 1/4-Z, 1/4-X$
- symmetry=  $1/4+Y, 1/4-Z, 1/4+X$
- symmetry=  $1/4-Y, 1/4+Z, 1/4+X$
- symmetry=  $1/4+Y, 1/4+Z, 1/4-X$
- symmetry=  $X, 1/2+Y, 1/2+Z$



- symmetry=  $-X, 1/2 - Y, 1/2 + Z$
- symmetry=  $-X, 1/2 + Y, 1/2 - Z$
- symmetry=  $X, 1/2 - Y, 1/2 - Z$
- symmetry=  $Z, 1/2 + X, 1/2 + Y$
- symmetry=  $Z, 1/2 - X, 1/2 - Y$
- symmetry=  $-Z, 1/2 - X, 1/2 + Y$
- symmetry=  $-Z, 1/2 + X, 1/2 - Y$
- symmetry=  $Y, 1/2 + Z, 1/2 + X$
- symmetry=  $-Y, 1/2 + Z, 1/2 - X$
- symmetry=  $Y, 1/2 - Z, 1/2 - X$
- symmetry=  $-Y, 1/2 - Z, 1/2 + X$
- symmetry=  $1/4 - X, 3/4 - Y, 3/4 - Z$
- symmetry=  $1/4 + X, 3/4 + Y, 3/4 - Z$
- symmetry=  $1/4 + X, 3/4 - Y, 3/4 + Z$
- symmetry=  $1/4 - X, 3/4 + Y, 3/4 + Z$
- symmetry=  $1/4 - Z, 3/4 - X, 3/4 - Y$
- symmetry=  $1/4 - Z, 3/4 + X, 3/4 + Y$
- symmetry=  $1/4 + Z, 3/4 + X, 3/4 - Y$
- symmetry=  $1/4 + Z, 3/4 - X, 3/4 + Y$
- symmetry=  $1/4 - Y, 3/4 - Z, 3/4 - X$
- symmetry=  $1/4 + Y, 3/4 - Z, 3/4 + X$
- symmetry=  $1/4 - Y, 3/4 + Z, 3/4 + X$
- symmetry=  $1/4 + Y, 3/4 + Z, 3/4 - X$
- symmetry=  $1/2 + X, Y, 1/2 + Z$
- symmetry=  $1/2 - X, -Y, 1/2 + Z$
- symmetry=  $1/2 - X, Y, 1/2 - Z$
- symmetry=  $1/2 + X, -Y, 1/2 - Z$
- symmetry=  $1/2 + Z, X, 1/2 + Y$
- symmetry=  $1/2 + Z, -X, 1/2 - Y$
- symmetry=  $1/2 - Z, -X, 1/2 + Y$
- symmetry=  $1/2 - Z, X, 1/2 - Y$
- symmetry=  $1/2 + Y, Z, 1/2 + X$
- symmetry=  $1/2 - Y, Z, 1/2 - X$
- symmetry=  $1/2 + Y, -Z, 1/2 - X$
- symmetry=  $1/2 - Y, -Z, 1/2 + X$
- symmetry=  $3/4 - X, 1/4 - Y, 3/4 - Z$
- symmetry=  $3/4 + X, 1/4 + Y, 3/4 - Z$
- symmetry=  $3/4 + X, 1/4 - Y, 3/4 + Z$
- symmetry=  $3/4 - X, 1/4 + Y, 3/4 + Z$
- symmetry=  $3/4 - Z, 1/4 - X, 3/4 - Y$
- symmetry=  $3/4 - Z, 1/4 + X, 3/4 + Y$
- symmetry=  $3/4 + Z, 1/4 + X, 3/4 - Y$
- symmetry=  $3/4 + Z, 1/4 - X, 3/4 + Y$
- symmetry=  $3/4 - Y, 1/4 - Z, 3/4 - X$
- symmetry=  $3/4 + Y, 1/4 - Z, 3/4 + X$
- symmetry=  $3/4 - Y, 1/4 + Z, 3/4 + X$
- symmetry=  $3/4 + Y, 1/4 + Z, 3/4 - X$
- symmetry=  $1/2 + X, 1/2 + Y, Z$
- symmetry=  $1/2 - X, 1/2 - Y, Z$
- symmetry=  $1/2 - X, 1/2 + Y, -Z$
- symmetry=  $1/2 + X, 1/2 - Y, -Z$
- symmetry=  $1/2 + Z, 1/2 + X, Y$
- symmetry=  $1/2 + Z, 1/2 - X, -Y$
- symmetry=  $1/2 - Z, 1/2 - X, Y$
- symmetry=  $1/2 - Z, 1/2 + X, -Y$
- symmetry=  $1/2 + Y, 1/2 + Z, X$
- symmetry=  $1/2 - Y, 1/2 + Z, -X$
- symmetry=  $1/2 + Y, 1/2 - Z, -X$

- symmetry=  $1/2-Y, 1/2-Z, X$
- symmetry=  $3/4-X, 3/4-Y, 1/4-Z$
- symmetry=  $3/4+X, 3/4+Y, 1/4-Z$
- symmetry=  $3/4+X, 3/4-Y, Z+1/4$
- symmetry=  $3/4-X, 3/4+Y, Z+1/4$
- symmetry=  $3/4-Z, 3/4-X, 1/4-Y$
- symmetry=  $3/4-Z, 3/4+X, 1/4+Y$
- symmetry=  $3/4+Z, 3/4+X, 1/4-Y$
- symmetry=  $3/4+Z, 3/4-X, 1/4+Y$
- symmetry=  $3/4-Y, 3/4-Z, 1/4-X$
- symmetry=  $3/4+Y, 3/4-Z, 1/4+X$
- symmetry=  $3/4-Y, 3/4+Z, 1/4+X$
- symmetry=  $3/4+Y, 3/4+Z, 1/4-X$
- asymm=  $0 < x \leq 1/2$  and  $0 < y \leq 1/4$  and  $-1/4 \leq z \leq 1/4$  and  $y \leq \min(x, 1/2-x)$  and  $-y \leq z \leq y$

## 204 Im-3

- Number of Symmetry Operators = 48
- Space Group Name = Im-3
- Crystal System = CUBIC
- Laue Class = m-3
- Point Group = m-3
- Patterson Space Group # = [204](#)
- Lattice Type = I
- symmetry=  $X, Y, Z$
- symmetry=  $-X, -Y, Z$
- symmetry=  $-X, Y, -Z$
- symmetry=  $X, -Y, -Z$
- symmetry=  $Z, X, Y$
- symmetry=  $Z, -X, -Y$
- symmetry=  $-Z, -X, Y$
- symmetry=  $-Z, X, -Y$
- symmetry=  $Y, Z, X$
- symmetry=  $-Y, Z, -X$
- symmetry=  $Y, -Z, -X$
- symmetry=  $-Y, -Z, X$
- symmetry=  $-X, -Y, -Z$
- symmetry=  $X, Y, -Z$
- symmetry=  $X, -Y, Z$
- symmetry=  $-X, Y, Z$
- symmetry=  $-Z, -X, -Y$
- symmetry=  $-Z, X, Y$
- symmetry=  $Z, X, -Y$
- symmetry=  $Z, -X, Y$
- symmetry=  $-Y, -Z, -X$
- symmetry=  $Y, -Z, X$
- symmetry=  $-Y, Z, X$
- symmetry=  $Y, Z, -X$
- symmetry=  $1/2+X, 1/2+Y, 1/2+Z$
- symmetry=  $1/2-X, 1/2-Y, 1/2+Z$
- symmetry=  $1/2-X, 1/2+Y, 1/2-Z$
- symmetry=  $1/2+X, 1/2-Y, 1/2-Z$
- symmetry=  $1/2+Z, 1/2+X, 1/2+Y$
- symmetry=  $1/2+Z, 1/2-X, 1/2-Y$
- symmetry=  $1/2-Z, 1/2-X, 1/2+Y$
- symmetry=  $1/2-Z, 1/2+X, 1/2-Y$
- symmetry=  $1/2+Y, 1/2+Z, 1/2+X$

- symmetry=  $1/2-Y, 1/2+Z, 1/2-X$
- symmetry=  $1/2+Y, 1/2-Z, 1/2-X$
- symmetry=  $1/2-Y, 1/2-Z, 1/2+X$
- symmetry=  $1/2-X, 1/2-Y, 1/2-Z$
- symmetry=  $1/2+X, 1/2+Y, 1/2-Z$
- symmetry=  $1/2+X, 1/2-Y, 1/2+Z$
- symmetry=  $1/2-X, 1/2+Y, 1/2+Z$
- symmetry=  $1/2-Z, 1/2-X, 1/2-Y$
- symmetry=  $1/2-Z, 1/2+X, 1/2+Y$
- symmetry=  $1/2+Z, 1/2+X, 1/2-Y$
- symmetry=  $1/2+Z, 1/2-X, 1/2+Y$
- symmetry=  $1/2-Y, 1/2-Z, 1/2-X$
- symmetry=  $1/2+Y, 1/2-Z, 1/2+X$
- symmetry=  $1/2-Y, 1/2+Z, 1/2+X$
- symmetry=  $1/2+Y, 1/2+Z, 1/2-X$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$  and  $y \leq x$  and  $z \leq y$

## 205 Pa-3

- Number of Symmetry Operators = 24
- Space Group Name = Pa-3
- Crystal System = CUBIC
- Laue Class = m-3
- Point Group = m-3
- Patterson Space Group # = [200](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry=  $1/2-X, -Y, 1/2+Z$
- symmetry=  $-X, 1/2+Y, 1/2-Z$
- symmetry=  $1/2+X, 1/2-Y, -Z$
- symmetry= Z,X,Y
- symmetry=  $1/2+Z, 1/2-X, -Y$
- symmetry=  $1/2-Z, -X, 1/2+Y$
- symmetry=  $-Z, 1/2+X, 1/2-Y$
- symmetry= Y,Z,X
- symmetry=  $-Y, 1/2+Z, 1/2-X$
- symmetry=  $1/2+Y, 1/2-Z, -X$
- symmetry=  $1/2-Y, -Z, 1/2+X$
- symmetry=  $-X, -Y, -Z$
- symmetry=  $1/2+X, Y, 1/2-Z$
- symmetry=  $X, 1/2-Y, 1/2+Z$
- symmetry=  $1/2-X, 1/2+Y, Z$
- symmetry=  $-Z, -X, -Y$
- symmetry=  $1/2-Z, 1/2+X, Y$
- symmetry=  $1/2+Z, X, 1/2-Y$
- symmetry=  $Z, 1/2-X, 1/2+Y$
- symmetry=  $-Y, -Z, -X$
- symmetry=  $Y, 1/2-Z, 1/2+X$
- symmetry=  $1/2-Y, 1/2+Z, X$
- symmetry=  $1/2+Y, Z, 1/2-X$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$  and  $z \leq \min(x, y)$

## 206 Ia-3

- Number of Symmetry Operators = 48
- Space Group Name = Ia-3

- Crystal System = CUBIC
- Laue Class = m-3
- Point Group = m-3
- Patterson Space Group # = [204](#)
- Lattice Type = I
- symmetry= X,Y,Z
- symmetry=  $1/2-X, -Y, 1/2+Z$
- symmetry=  $-X, 1/2+Y, 1/2-Z$
- symmetry=  $1/2+X, 1/2-Y, -Z$
- symmetry= Z,X,Y
- symmetry=  $1/2+Z, 1/2-X, -Y$
- symmetry=  $1/2-Z, -X, 1/2+Y$
- symmetry=  $-Z, 1/2+X, 1/2-Y$
- symmetry= Y,Z,X
- symmetry=  $-Y, 1/2+Z, 1/2-X$
- symmetry=  $1/2+Y, 1/2-Z, -X$
- symmetry=  $1/2-Y, -Z, 1/2+X$
- symmetry=  $-X, -Y, -Z$
- symmetry=  $1/2+X, Y, 1/2-Z$
- symmetry=  $X, 1/2-Y, 1/2+Z$
- symmetry=  $1/2-X, 1/2+Y, Z$
- symmetry=  $-Z, -X, -Y$
- symmetry=  $1/2-Z, 1/2+X, Y$
- symmetry=  $1/2+Z, X, 1/2-Y$
- symmetry=  $Z, 1/2-X, 1/2+Y$
- symmetry=  $-Y, -Z, -X$
- symmetry=  $Y, 1/2-Z, 1/2+X$
- symmetry=  $1/2-Y, 1/2+Z, X$
- symmetry=  $1/2+Y, Z, 1/2-X$
- symmetry=  $1/2+X, 1/2+Y, 1/2+Z$
- symmetry=  $-X, 1/2-Y, Z$
- symmetry=  $1/2-X, +Y, -Z$
- symmetry=  $X, -Y, 1/2-Z$
- symmetry=  $1/2+Z, 1/2+X, 1/2+Y$
- symmetry=  $Z, -X, 1/2-Y$
- symmetry=  $-Z, 1/2-X, Y$
- symmetry=  $1/2-Z, X, -Y$
- symmetry=  $1/2+Y, 1/2+Z, 1/2+X$
- symmetry=  $1/2-Y, Z, -X$
- symmetry=  $Y, -Z, 1/2-X$
- symmetry=  $-Y, 1/2-Z, X$
- symmetry=  $1/2-X, 1/2-Y, 1/2-Z$
- symmetry=  $X, 1/2+Y, -Z$
- symmetry=  $1/2+X, -Y, Z$
- symmetry=  $-X, Y, 1/2+Z$
- symmetry=  $1/2-Z, 1/2-X, 1/2-Y$
- symmetry=  $-Z, X, 1/2+Y$
- symmetry=  $Z, 1/2+X, -Y$
- symmetry=  $1/2+Z, -X, Y$
- symmetry=  $1/2-Y, 1/2-Z, 1/2-X$
- symmetry=  $1/2+Y, -Z, X$
- symmetry=  $-Y, Z, 1/2+X$
- symmetry=  $Y, 1/2+Z, -X$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/4$  and  $z \leq \min(x, 1/2-x, 1/2-y)$

- Number of Symmetry Operators = 24
- Space Group Name = P432
- Crystal System = CUBIC
- Laue Class = m-3m
- Point Group = 432
- Patterson Space Group # = [221](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= -X,Y,-Z
- symmetry= X,-Y,-Z
- symmetry= Z,X,Y
- symmetry= Z,-X,-Y
- symmetry= -Z,-X,Y
- symmetry= -Z,X,-Y
- symmetry= Y,Z,X
- symmetry= -Y,Z,-X
- symmetry= Y,-Z,-X
- symmetry= -Y,-Z,X
- symmetry= Y,X,-Z
- symmetry= -Y,-X,-Z
- symmetry= Y,-X,Z
- symmetry= -Y,X,Z
- symmetry= X,Z,-Y
- symmetry= -X,Z,Y
- symmetry= -X,-Z,-Y
- symmetry= X,-Z,Y
- symmetry= Z,Y,-X
- symmetry= Z,-Y,X
- symmetry= -Z,Y,X
- symmetry= -Z,-Y,-X
- asymm=  $0 \leq x \leq 1$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$  and  $y \leq \min(x, 1-x)$  and  $z \leq y$

## 208 P4(2)32

- Number of Symmetry Operators = 24
- Space Group Name = P4(2)32
- Crystal System = CUBIC
- Laue Class = m-3m
- Point Group = 432
- Patterson Space Group # = [221](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= -X,Y,-Z
- symmetry= X,-Y,-Z
- symmetry= Z,X,Y
- symmetry= Z,-X,-Y
- symmetry= -Z,-X,Y
- symmetry= -Z,X,-Y
- symmetry= Y,Z,X
- symmetry= -Y,Z,-X
- symmetry= Y,-Z,-X
- symmetry= -Y,-Z,X
- symmetry=  $1/2 + Y, 1/2 + X, 1/2 - Z$
- symmetry=  $1/2 - Y, 1/2 - X, 1/2 - Z$
- symmetry=  $1/2 + Y, 1/2 - X, 1/2 + Z$

- symmetry=  $1/2-Y, 1/2+X, 1/2+Z$
- symmetry=  $1/2+X, 1/2+Z, 1/2-Y$
- symmetry=  $1/2-X, 1/2+Z, 1/2+Y$
- symmetry=  $1/2-X, 1/2-Z, 1/2-Y$
- symmetry=  $1/2+X, 1/2-Z, 1/2+Y$
- symmetry=  $1/2+Z, 1/2+Y, 1/2-X$
- symmetry=  $1/2+Z, 1/2-Y, 1/2+X$
- symmetry=  $1/2-Z, 1/2+Y, 1/2+X$
- symmetry=  $1/2-Z, 1/2-Y, 1/2-X$
- asymm=  $0 < x < 1/2$  and  $0 < y < 1/2$  and  $-1/4 < z < 1/4$  and  $\max(-x, x-1/2, -y, y-1/2) < z < \min(x, 1/2-x, y, 1/2-y)$

## 209 F432

- Number of Symmetry Operators = 96
- Space Group Name = F432
- Crystal System = CUBIC
- Laue Class = m-3m
- Point Group = 432
- Patterson Space Group # = [225](#)
- Lattice Type = F
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= -X,Y,-Z
- symmetry= X,-Y,-Z
- symmetry= Z,X,Y
- symmetry= Z,-X,-Y
- symmetry= -Z,-X,Y
- symmetry= -Z,X,-Y
- symmetry= Y,Z,X
- symmetry= -Y,Z,-X
- symmetry= Y,-Z,-X
- symmetry= -Y,-Z,X
- symmetry= Y,X,-Z
- symmetry= -Y,-X,-Z
- symmetry= Y,-X,Z
- symmetry= -Y,X,Z
- symmetry= X,Z,-Y
- symmetry= -X,Z,Y
- symmetry= -X,-Z,-Y
- symmetry= X,-Z,Y
- symmetry= Z,Y,-X
- symmetry= Z,-Y,X
- symmetry= -Z,Y,X
- symmetry= -Z,-Y,-X
- symmetry= X,1/2+Y,1/2+Z
- symmetry= -X,1/2-Y,1/2+Z
- symmetry= -X,1/2+Y,1/2-Z
- symmetry= X,1/2-Y,1/2-Z
- symmetry= Z,1/2+X,1/2+Y
- symmetry= Z,1/2-X,1/2-Y
- symmetry= -Z,1/2-X,1/2+Y
- symmetry= -Z,1/2+X,1/2-Y
- symmetry= Y,1/2+Z,1/2+X
- symmetry= -Y,1/2+Z,1/2-X
- symmetry= Y,1/2-Z,1/2-X
- symmetry= -Y,1/2-Z,1/2+X

- symmetry=  $Y, 1/2+X, 1/2-Z$
- symmetry=  $-Y, 1/2-X, 1/2-Z$
- symmetry=  $Y, 1/2-X, 1/2+Z$
- symmetry=  $-Y, 1/2+X, 1/2+Z$
- symmetry=  $X, 1/2+Z, 1/2-Y$
- symmetry=  $-X, 1/2+Z, 1/2+Y$
- symmetry=  $-X, 1/2-Z, 1/2-Y$
- symmetry=  $X, 1/2-Z, 1/2+Y$
- symmetry=  $Z, 1/2+Y, 1/2-X$
- symmetry=  $Z, 1/2-Y, 1/2+X$
- symmetry=  $-Z, 1/2+Y, 1/2+X$
- symmetry=  $-Z, 1/2-Y, 1/2-X$
- symmetry=  $1/2+X, Y, 1/2+Z$
- symmetry=  $1/2-X, -Y, 1/2+Z$
- symmetry=  $1/2-X, Y, 1/2-Z$
- symmetry=  $1/2+X, -Y, 1/2-Z$
- symmetry=  $1/2+Z, X, 1/2+Y$
- symmetry=  $1/2+Z, -X, 1/2-Y$
- symmetry=  $1/2-Z, -X, 1/2+Y$
- symmetry=  $1/2-Z, X, 1/2-Y$
- symmetry=  $1/2+Y, Z, 1/2+X$
- symmetry=  $1/2-Y, Z, 1/2-X$
- symmetry=  $1/2+Y, -Z, 1/2-X$
- symmetry=  $1/2-Y, -Z, 1/2+X$
- symmetry=  $1/2+Y, X, 1/2-Z$
- symmetry=  $1/2-Y, -X, 1/2-Z$
- symmetry=  $1/2+Y, -X, 1/2+Z$
- symmetry=  $1/2-Y, X, 1/2+Z$
- symmetry=  $1/2+X, Z, 1/2-Y$
- symmetry=  $1/2-X, Z, 1/2+Y$
- symmetry=  $1/2-X, -Z, 1/2-Y$
- symmetry=  $1/2+X, -Z, 1/2+Y$
- symmetry=  $1/2+Z, Y, 1/2-X$
- symmetry=  $1/2+Z, -Y, 1/2+X$
- symmetry=  $1/2-Z, Y, 1/2+X$
- symmetry=  $1/2-Z, -Y, 1/2-X$
- {\*\*\*\*}
- symmetry=  $1/2+X, 1/2+Y, Z$
- symmetry=  $1/2-X, 1/2-Y, Z$
- symmetry=  $1/2-X, 1/2+Y, -Z$
- symmetry=  $1/2+X, 1/2-Y, -Z$
- symmetry=  $1/2+Z, 1/2+X, Y$
- symmetry=  $1/2+Z, 1/2-X, -Y$
- symmetry=  $1/2-Z, 1/2-X, Y$
- symmetry=  $1/2-Z, 1/2+X, -Y$
- symmetry=  $1/2+Y, 1/2+Z, X$
- symmetry=  $1/2-Y, 1/2+Z, -X$
- symmetry=  $1/2+Y, 1/2-Z, -X$
- symmetry=  $1/2-Y, 1/2-Z, X$
- symmetry=  $1/2+Y, 1/2+X, -Z$
- symmetry=  $1/2-Y, 1/2-X, -Z$
- symmetry=  $1/2+Y, 1/2-X, Z$
- symmetry=  $1/2-Y, 1/2+X, Z$
- symmetry=  $1/2+X, 1/2+Z, -Y$
- symmetry=  $1/2-X, 1/2+Z, Y$
- symmetry=  $1/2-X, 1/2-Z, -Y$
- symmetry=  $1/2+X, 1/2-Z, Y$
- symmetry=  $1/2+Z, 1/2+Y, -X$

- symmetry=  $1/2+Z, 1/2-Y, X$
- symmetry=  $1/2-Z, 1/2+Y, X$
- symmetry=  $1/2-Z, 1/2-Y, -X$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/4$  and  $-1/4 \leq z \leq 1/4$  and  $y \leq \min(x, 1/2-x)$  and  $-y \leq z \leq y$

## 210 F4(1)32

- Number of Symmetry Operators = 96
- Space Group Name = F4(1)32
- Crystal System = CUBIC
- Laue Class = m-3m
- Point Group = 432
- Patterson Space Group # = [225](#)
- Lattice Type = F
- symmetry=  $X, Y, Z$
- symmetry=  $-X, 1/2-Y, 1/2+Z$
- symmetry=  $1/2-X, 1/2+Y, -Z$
- symmetry=  $1/2+X, -Y, 1/2-Z$
- symmetry=  $Z, X, Y$
- symmetry=  $1/2+Z, -X, 1/2-Y$
- symmetry=  $-Z, 1/2-X, 1/2+Y$
- symmetry=  $1/2-Z, 1/2+X, -Y$
- symmetry=  $Y, Z, X$
- symmetry=  $1/2-Y, 1/2+Z, -X$
- symmetry=  $1/2+Y, -Z, 1/2-X$
- symmetry=  $-Y, 1/2-Z, 1/2+X$
- symmetry=  $3/4+Y, 1/4+X, 3/4-Z$
- symmetry=  $1/4-Y, 1/4-X, 1/4-Z$
- symmetry=  $1/4+Y, 3/4-X, 3/4+Z$
- symmetry=  $3/4-Y, 3/4+X, 1/4+Z$
- {\* << \*}
- symmetry=  $3/4+X, 1/4+Z, 3/4-Y$
- symmetry=  $3/4-X, 3/4+Z, 1/4+Y$
- symmetry=  $1/4-X, 1/4-Z, 1/4-Y$
- symmetry=  $1/4+X, 3/4-Z, 3/4+Y$
- symmetry=  $3/4+Z, 1/4+Y, 3/4-X$
- symmetry=  $1/4+Z, 3/4-Y, 3/4+X$
- symmetry=  $3/4-Z, 3/4+Y, 1/4+X$
- symmetry=  $1/4-Z, 1/4-Y, 1/4-X$
- symmetry=  $X, 1/2+Y, 1/2+Z$
- symmetry=  $-X, -Y, Z$
- symmetry=  $1/2-X, Y, 1/2-Z$
- symmetry=  $1/2+X, 1/2-Y, -Z$
- symmetry=  $Z, 1/2+X, 1/2+Y$
- symmetry=  $1/2+Z, 1/2-X, -Y$
- symmetry=  $-Z, -X, Y$
- symmetry=  $1/2-Z, X, 1/2-Y$
- symmetry=  $Y, 1/2+Z, 1/2+X$
- symmetry=  $1/2-Y, Z, 1/2-X$
- symmetry=  $1/2+Y, 1/2-Z, -X$
- symmetry=  $-Y, -Z, X$
- symmetry=  $3/4+Y, 3/4+X, 1/4-Z$
- symmetry=  $1/4-Y, 3/4-X, 3/4-Z$
- symmetry=  $1/4+Y, 1/4-X, 1/4+Z$
- symmetry=  $3/4-Y, 1/4+X, 3/4+Z$
- {\* << \*}
- symmetry=  $3/4+X, 3/4+Z, 1/4-Y$



- symmetry=  $3/4-X, 1/4+Z, 3/4+Y$
- symmetry=  $1/4-X, 3/4-Z, 3/4-Y$
- symmetry=  $1/4+X, 1/4-Z, 1/4+Y$
- symmetry=  $3/4+Z, 3/4+Y, 1/4-X$
- symmetry=  $1/4+Z, 1/4-Y, 1/4+X$
- symmetry=  $3/4-Z, 1/4+Y, 3/4+X$
- symmetry=  $1/4-Z, 3/4-Y, 3/4-X$
- symmetry=  $1/2+X, Y, 1/2+Z$
- symmetry=  $1/2-X, 1/2-Y, Z$
- symmetry=  $-X, 1/2+Y, 1/2-Z$
- symmetry=  $X, -Y, -Z$
- symmetry=  $1/2+Z, X, 1/2+Y$
- symmetry=  $Z, -X, -Y$
- symmetry=  $1/2-Z, 1/2-X, Y$
- symmetry=  $-Z, 1/2+X, 1/2-Y$
- symmetry=  $1/2+Y, Z, 1/2+X$
- symmetry=  $-Y, 1/2+Z, 1/2-X$
- symmetry=  $Y, -Z, -X$
- symmetry=  $1/2-Y, 1/2-Z, X$
- symmetry=  $1/4+Y, 1/4+X, 1/4-Z$
- symmetry=  $3/4-Y, 1/4-X, 3/4-Z$
- symmetry=  $3/4+Y, 3/4-X, 1/4+Z$
- symmetry=  $1/4-Y, 3/4+X, 3/4+Z$
- {\* << \*}
- symmetry=  $1/4+X, 1/4+Z, 1/4-Y$
- symmetry=  $1/4-X, 3/4+Z, 3/4+Y$
- symmetry=  $3/4-X, 1/4-Z, 3/4-Y$
- symmetry=  $3/4+X, 3/4-Z, 1/4+Y$
- symmetry=  $1/4+Z, 1/4+Y, 1/4-X$
- symmetry=  $3/4+Z, 3/4-Y, 1/4+X$
- symmetry=  $1/4-Z, 3/4+Y, 3/4+X$
- symmetry=  $3/4-Z, 1/4-Y, 3/4-X$
- symmetry=  $1/2+X, 1/2+Y, Z$
- symmetry=  $1/2-X, -Y, 1/2+Z$
- symmetry=  $-X, Y, -Z$
- symmetry=  $X, 1/2-Y, 1/2-Z$
- symmetry=  $1/2+Z, 1/2+X, Y$
- symmetry=  $Z, 1/2-X, 1/2-Y$
- symmetry=  $1/2-Z, -X, 1/2+Y$
- symmetry=  $-Z, X, -Y$
- symmetry=  $1/2+Y, 1/2+Z, X$
- symmetry=  $-Y, Z, -X$
- symmetry=  $Y, 1/2-Z, 1/2-X$
- symmetry=  $1/2-Y, -Z, 1/2+X$
- symmetry=  $1/4+Y, 3/4+X, 3/4-Z$
- symmetry=  $3/4-Y, 3/4-X, 1/4-Z$
- symmetry=  $3/4+Y, 1/4-X, 3/4+Z$
- symmetry=  $1/4-Y, 1/4+X, 1/4+Z$
- {\* << \*}
- symmetry=  $1/4+X, 3/4+Z, 3/4-Y$
- symmetry=  $1/4-X, 1/4+Z, 1/4+Y$
- symmetry=  $3/4-X, 3/4-Z, 1/4-Y$
- symmetry=  $3/4+X, 1/4-Z, 3/4+Y$
- symmetry=  $1/4+Z, 3/4+Y, 3/4-X$
- symmetry=  $3/4+Z, 1/4-Y, 3/4+X$
- symmetry=  $1/4-Z, 1/4+Y, 1/4+X$
- symmetry=  $3/4-Z, 3/4-Y, 1/4-X$
- asymm=  $0 < x \leq 1/2$  and  $-1/8 \leq y \leq 1/8$  and  $-1/8 \leq z \leq 1/8$  and  $y \leq \min(x, 1/2-x)$  and  $-y \leq z \leq \min(x, 1/2-x)$

## 211 I432

- Number of Symmetry Operators = 48
- Space Group Name = I432
- Crystal System = CUBIC
- Laue Class = m-3m
- Point Group = 432
- Patterson Space Group # = [229](#)
- Lattice Type = I
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= -X,Y,-Z
- symmetry= X,-Y,-Z
- symmetry= Z,X,Y
- symmetry= Z,-X,-Y
- symmetry= -Z,-X,Y
- symmetry= -Z,X,-Y
- symmetry= Y,Z,X
- symmetry= -Y,Z,-X
- symmetry= Y,-Z,-X
- symmetry= -Y,-Z,X
- symmetry= Y,X,-Z
- symmetry= -Y,-X,-Z
- symmetry= Y,-X,Z
- symmetry= -Y,X,Z
- symmetry= X,Z,-Y
- symmetry= -X,Z,Y
- symmetry= -X,-Z,-Y
- symmetry= X,-Z,Y
- symmetry= Z,Y,-X
- symmetry= Z,-Y,X
- symmetry= -Z,Y,X
- symmetry= -Z,-Y,-X
- symmetry=  $1/2+X, 1/2+Y, 1/2+Z$
- symmetry=  $1/2-X, 1/2-Y, 1/2+Z$
- symmetry=  $1/2-X, 1/2+Y, 1/2-Z$
- symmetry=  $1/2+X, 1/2-Y, 1/2-Z$
- symmetry=  $1/2+Z, 1/2+X, 1/2+Y$
- symmetry=  $1/2+Z, 1/2-X, 1/2-Y$
- symmetry=  $1/2-Z, 1/2-X, 1/2+Y$
- symmetry=  $1/2-Z, 1/2+X, 1/2-Y$
- symmetry=  $1/2+Y, 1/2+Z, 1/2+X$
- symmetry=  $1/2-Y, 1/2+Z, 1/2-X$
- symmetry=  $1/2+Y, 1/2-Z, 1/2-X$
- symmetry=  $1/2-Y, 1/2-Z, 1/2+X$
- symmetry=  $1/2+Y, 1/2+X, 1/2-Z$
- symmetry=  $1/2-Y, 1/2-X, 1/2-Z$
- symmetry=  $1/2+Y, 1/2-X, 1/2+Z$
- symmetry=  $1/2-Y, 1/2+X, 1/2+Z$
- symmetry=  $1/2+X, 1/2+Z, 1/2-Y$
- symmetry=  $1/2-X, 1/2+Z, 1/2+Y$
- symmetry=  $1/2-X, 1/2-Z, 1/2-Y$
- symmetry=  $1/2+X, 1/2-Z, 1/2+Y$
- symmetry=  $1/2+Z, 1/2+Y, 1/2-X$
- symmetry=  $1/2+Z, 1/2-Y, 1/2+X$
- symmetry=  $1/2-Z, 1/2+Y, 1/2+X$
- symmetry=  $1/2-Z, 1/2-Y, 1/2-X$

- $\text{asymm} = 0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/4$  and  $z \leq \min(x, 1/2-x, y, 1/2-y)$

## 212 P4(3)32

- Number of Symmetry Operators = 24
- Space Group Name = P4(3)32
- Crystal System = CUBIC
- Laue Class = m-3m
- Point Group = 432
- Patterson Space Group # = [221](#)
- Lattice Type = P
- symmetry = X,Y,Z
- symmetry =  $1/2-X, -Y, 1/2+Z$
- symmetry =  $-X, 1/2+Y, 1/2-Z$
- symmetry =  $1/2+X, 1/2-Y, -Z$
- symmetry = Z,X,Y
- symmetry =  $1/2+Z, 1/2-X, -Y$
- symmetry =  $1/2-Z, -X, 1/2+Y$
- symmetry =  $-Z, 1/2+X, 1/2-Y$
- symmetry = Y,Z,X
- symmetry =  $-Y, 1/2+Z, 1/2-X$
- symmetry =  $1/2+Y, 1/2-Z, -X$
- symmetry =  $1/2-Y, -Z, 1/2+X$
- symmetry =  $1/4+Y, 3/4+X, 3/4-Z$
- symmetry =  $1/4-Y, 1/4-X, 1/4-Z$
- symmetry =  $3/4+Y, 3/4-X, 1/4+Z$
- symmetry =  $3/4-Y, 1/4+X, 3/4+Z$
- symmetry =  $1/4+X, 3/4+Z, 3/4-Y$
- symmetry =  $3/4-X, 1/4+Z, 3/4+Y$
- symmetry =  $1/4-X, 1/4-Z, 1/4-Y$
- symmetry =  $3/4+X, 3/4-Z, 1/4+Y$
- symmetry =  $1/4+Z, 3/4+Y, 3/4-X$
- symmetry =  $3/4+Z, 3/4-Y, 1/4+X$
- symmetry =  $3/4-Z, 1/4+Y, 3/4+X$
- symmetry =  $1/4-Z, 1/4-Y, 1/4-X$
- $\text{asymm} = 0 \leq x \leq 1/2$  and  $0 \leq y \leq 3/4$  and  $-1/2 \leq z \leq 1/4$  and  $\max(-y, x-1/2) \leq z \leq \min(1/2-y, 2x-y, 2y-x, y-2x+1/2)$

## 213 P4(1)32

- Number of Symmetry Operators = 24
- Space Group Name = P4(1)32
- Crystal System = CUBIC
- Laue Class = m-3m
- Point Group = 432
- Patterson Space Group # = [221](#)
- Lattice Type = P
- symmetry = X,Y,Z
- symmetry =  $1/2-X, -Y, 1/2+Z$
- symmetry =  $-X, 1/2+Y, 1/2-Z$
- symmetry =  $1/2+X, 1/2-Y, -Z$
- symmetry = Z,X,Y
- symmetry =  $1/2+Z, 1/2-X, -Y$
- symmetry =  $1/2-Z, -X, 1/2+Y$
- symmetry =  $-Z, 1/2+X, 1/2-Y$
- symmetry = Y,Z,X

- symmetry=  $-Y, 1/2+Z, 1/2-X$
- symmetry=  $1/2+Y, 1/2-Z, -X$
- symmetry=  $1/2-Y, -Z, 1/2+X$
- symmetry=  $3/4+Y, 1/4+X, 1/4-Z$
- symmetry=  $3/4-Y, 3/4-X, 3/4-Z$
- symmetry=  $1/4+Y, 1/4-X, 3/4+Z$
- symmetry=  $1/4-Y, 3/4+X, 1/4+Z$
- symmetry=  $3/4+X, 1/4+Z, 1/4-Y$
- symmetry=  $1/4-X, 3/4+Z, 1/4+Y$
- symmetry=  $3/4-X, 3/4-Z, 3/4-Y$
- symmetry=  $1/4+X, 1/4-Z, 3/4+Y$
- symmetry=  $3/4+Z, 1/4+Y, 1/4-X$
- symmetry=  $1/4+Z, 1/4-Y, 3/4+X$
- symmetry=  $1/4-Z, 3/4+Y, 1/4+X$
- symmetry=  $3/4-Z, 3/4-Y, 3/4-X$
- asymm=  $-1/4 < x <= 1/2$  and  $0 <= y <= 3/4$  and  $0 <= z <= 1/2$  and  $x <= y <= x+1/2$  and  $y-x)/2 <= z <= \min(y, (-4x-2y+3)/2, (3-2x-2y)/4)$

## 214 I4(1)32

- Number of Symmetry Operators = 48
- Space Group Name = I4(1)32
- Crystal System = CUBIC
- Laue Class = m-3m
- Point Group = 432
- Patterson Space Group # = [229](#)
- Lattice Type = I
- symmetry= X,Y,Z
- symmetry=  $1/2-X, -Y, 1/2+Z$
- symmetry=  $-X, 1/2+Y, 1/2-Z$
- symmetry=  $1/2+X, 1/2-Y, -Z$
- symmetry= Z,X,Y
- symmetry=  $1/2+Z, 1/2-X, -Y$
- symmetry=  $1/2-Z, -X, 1/2+Y$
- symmetry=  $-Z, 1/2+X, 1/2-Y$
- symmetry= Y,Z,X
- symmetry=  $-Y, 1/2+Z, 1/2-X$
- symmetry=  $1/2+Y, 1/2-Z, -X$
- symmetry=  $1/2-Y, -Z, 1/2+X$
- symmetry=  $3/4+Y, 1/4+X, 1/4-Z$
- symmetry=  $3/4-Y, 3/4-X, 3/4-Z$
- symmetry=  $1/4+Y, 1/4-X, 3/4+Z$
- symmetry=  $1/4-Y, 3/4+X, 1/4+Z$
- symmetry=  $3/4+X, 1/4+Z, 1/4-Y$
- symmetry=  $1/4-X, 3/4+Z, 1/4+Y$
- symmetry=  $3/4-X, 3/4-Z, 3/4-Y$
- symmetry=  $1/4+X, 1/4-Z, 3/4+Y$
- symmetry=  $3/4+Z, 1/4+Y, 1/4-X$
- symmetry=  $1/4+Z, 1/4-Y, 3/4+X$
- symmetry=  $1/4-Z, 3/4+Y, 1/4+X$
- symmetry=  $3/4-Z, 3/4-Y, 3/4-X$
- symmetry=  $1/2+X, 1/2+Y, 1/2+Z$
- symmetry=  $-X, 1/2-Y, Z$
- symmetry=  $1/2-X, Y, -Z$
- symmetry=  $X, -Y, 1/2-Z$
- symmetry=  $1/2+Z, 1/2+X, 1/2+Y$
- symmetry=  $Z, -X, 1/2-Y$

- symmetry=  $-Z, 1/2-X, Y$
- symmetry=  $1/2-Z, X, -Y$
- symmetry=  $1/2+Y, 1/2+Z, 1/2+X$
- symmetry=  $1/2-Y, Z, -X$
- symmetry=  $Y, -Z, 1/2-X$
- symmetry=  $-Y, 1/2-Z, X$
- symmetry=  $1/4+Y, 3/4+X, 3/4-Z$
- symmetry=  $1/4-Y, 1/4-X, 1/4-Z$
- symmetry=  $3/4+Y, 3/4-X, 1/4+Z$
- symmetry=  $3/4-Y, 1/4+X, 3/4+Z$
- symmetry=  $1/4+X, 3/4+Z, 3/4-Y$
- symmetry=  $3/4-X, 1/4+Z, 3/4+Y$
- symmetry=  $1/4-X, 1/4-Z, 1/4-Y$
- symmetry=  $3/4+X, 3/4-Z, 1/4+Y$
- symmetry=  $1/4+Z, 3/4+Y, 3/4-X$
- symmetry=  $3/4+Z, 3/4-Y, 1/4+X$
- symmetry=  $3/4-Z, 1/4+Y, 3/4+X$
- symmetry=  $1/4-Z, 1/4-Y, 1/4-X$
- asymm=  $-3/8 \leq x \leq 1/8$  and  $-1/8 \leq y \leq 1/8$  and  $-1/8 \leq z \leq 3/8$  and  $\max(x, y, y-x-1/8) \leq z \leq y+1/4$

## 215 P-43m

- Number of Symmetry Operators = 24
- Space Group Name = P-43m
- Crystal System = CUBIC
- Laue Class = m-3m
- Point Group = -43m
- Patterson Space Group # = [221](#)
- Lattice Type = P
- symmetry=  $X, Y, Z$
- symmetry=  $-X, -Y, Z$
- symmetry=  $-X, Y, -Z$
- symmetry=  $X, -Y, -Z$
- symmetry=  $Z, X, Y$
- symmetry=  $Z, -X, -Y$
- symmetry=  $-Z, -X, Y$
- symmetry=  $-Z, X, -Y$
- symmetry=  $Y, Z, X$
- symmetry=  $-Y, Z, -X$
- symmetry=  $Y, -Z, -X$
- symmetry=  $-Y, -Z, X$
- symmetry=  $Y, X, Z$
- symmetry=  $-Y, -X, Z$
- symmetry=  $Y, -X, -Z$
- symmetry=  $-Y, X, -Z$
- symmetry=  $X, Z, Y$
- symmetry=  $-X, Z, -Y$
- symmetry=  $-X, -Z, Y$
- symmetry=  $X, -Z, -Y$
- symmetry=  $Z, Y, X$
- symmetry=  $Z, -Y, -X$
- symmetry=  $-Z, Y, -X$
- symmetry=  $-Z, -Y, X$
- asymm=  $0 \leq x \leq 1$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$  and  $y \leq \min(x, 1-x)$  and  $z \leq y$

## 216 F4-3m

- Number of Symmetry Operators = 96
- Space Group Name = F4-3m
- Crystal System = CUBIC
- Laue Class = m-3m
- Point Group = -43m
- Patterson Space Group # = [225](#)
- Lattice Type = F
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= -X,Y,-Z
- symmetry= X,-Y,-Z
- symmetry= Z,X,Y
- symmetry= Z,-X,-Y
- symmetry= -Z,-X,Y
- symmetry= -Z,X,-Y
- symmetry= Y,Z,X
- symmetry= -Y,Z,-X
- symmetry= Y,-Z,-X
- symmetry= -Y,-Z,X
- symmetry= Y,X,Z
- symmetry= -Y,-X,Z
- symmetry= Y,-X,-Z
- symmetry= -Y,X,-Z
- symmetry= X,Z,Y
- symmetry= -X,Z,-Y
- symmetry= -X,-Z,Y
- symmetry= X,-Z,-Y
- symmetry= Z,Y,X
- symmetry= Z,-Y,-X
- symmetry= -Z,Y,-X
- symmetry= -Z,-Y,X
- symmetry= X,1/2+Y,1/2+Z
- symmetry= -X,1/2-Y,1/2+Z
- symmetry= -X,1/2+Y,1/2-Z
- symmetry= X,1/2-Y,1/2-Z
- symmetry= Z,1/2+X,1/2+Y
- symmetry= Z,1/2-X,1/2-Y
- symmetry= -Z,1/2-X,1/2+Y
- symmetry= -Z,1/2+X,1/2-Y
- symmetry= Y,1/2+Z,1/2+X
- symmetry= -Y,1/2+Z,1/2-X
- symmetry= Y,1/2-Z,1/2-X
- symmetry= -Y,1/2-Z,1/2+X
- symmetry= Y,1/2+X,1/2+Z
- symmetry= -Y,1/2-X,1/2+Z
- symmetry= Y,1/2-X,1/2-Z
- symmetry= -Y,1/2+X,1/2-Z
- symmetry= X,1/2+Z,1/2+Y
- symmetry= -X,1/2+Z,1/2-Y
- symmetry= -X,1/2-Z,1/2+Y
- symmetry= X,1/2-Z,1/2-Y
- symmetry= Z,1/2+Y,1/2+X
- symmetry= Z,1/2-Y,1/2-X
- symmetry= -Z,1/2+Y,1/2-X
- symmetry= -Z,1/2-Y,1/2+X
- symmetry= 1/2+X,Y,1/2+Z
- symmetry= 1/2-X,-Y,1/2+Z
- symmetry= 1/2-X,Y,1/2-Z

- symmetry=  $1/2+X,-Y,1/2-Z$
- symmetry=  $1/2+Z,X,1/2+Y$
- symmetry=  $1/2+Z,-X,1/2-Y$
- symmetry=  $1/2-Z,-X,1/2+Y$
- symmetry=  $1/2-Z,X,1/2-Y$
- symmetry=  $1/2+Y,Z,1/2+X$
- symmetry=  $1/2-Y,Z,1/2-X$
- symmetry=  $1/2+Y,-Z,1/2-X$
- symmetry=  $1/2-Y,-Z,1/2+X$
- symmetry=  $1/2+Y,X,1/2+Z$
- symmetry=  $1/2-Y,-X,1/2+Z$
- symmetry=  $1/2+Y,-X,1/2-Z$
- symmetry=  $1/2-Y,X,1/2-Z$
- symmetry=  $1/2+X,Z,1/2+Y$
- symmetry=  $1/2-X,Z,1/2-Y$
- symmetry=  $1/2-X,-Z,1/2+Y$
- symmetry=  $1/2+X,-Z,1/2-Y$
- symmetry=  $1/2+Z,Y,1/2+X$
- symmetry=  $1/2+Z,-Y,1/2-X$
- symmetry=  $1/2-Z,Y,1/2-X$
- symmetry=  $1/2-Z,-Y,1/2+X$
- symmetry=  $1/2+X,1/2+Y,Z$
- symmetry=  $1/2-X,1/2-Y,Z$
- symmetry=  $1/2-X,1/2+Y,-Z$
- symmetry=  $1/2+X,1/2-Y,-Z$
- symmetry=  $1/2+Z,1/2+X,Y$
- symmetry=  $1/2+Z,1/2-X,-Y$
- symmetry=  $1/2-Z,1/2-X,Y$
- symmetry=  $1/2-Z,1/2+X,-Y$
- symmetry=  $1/2+Y,1/2+Z,X$
- symmetry=  $1/2-Y,1/2+Z,-X$
- symmetry=  $1/2+Y,1/2-Z,-X$
- symmetry=  $1/2-Y,1/2-Z,X$
- symmetry=  $1/2+Y,1/2+X,Z$
- symmetry=  $1/2-Y,1/2-X,Z$
- symmetry=  $1/2+Y,1/2-X,-Z$
- symmetry=  $1/2-Y,1/2+X,-Z$
- symmetry=  $1/2+X,1/2+Z,Y$
- symmetry=  $1/2-X,1/2+Z,-Y$
- symmetry=  $1/2-X,1/2-Z,Y$
- symmetry=  $1/2+X,1/2-Z,-Y$
- symmetry=  $1/2+Z,1/2+Y,X$
- symmetry=  $1/2+Z,1/2-Y,-X$
- symmetry=  $1/2-Z,1/2+Y,-X$
- symmetry=  $1/2-Z,1/2-Y,X$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/4$  and  $-1/4 \leq z \leq 1/4$  and  $y \leq \min(x, 1/2-x)$  and  $-y \leq z \leq y$

## 217 I-43m

- Number of Symmetry Operators = 48
- Space Group Name = I-43m
- Crystal System = CUBIC
- Laue Class = m-3m
- Point Group = -43m
- Patterson Space Group # = [229](#)
- Lattice Type = I
- symmetry= X,Y,Z

- symmetry=  $-X, -Y, Z$
- symmetry=  $-X, Y, -Z$
- symmetry=  $X, -Y, -Z$
- symmetry=  $Z, X, Y$
- symmetry=  $Z, -X, -Y$
- symmetry=  $-Z, -X, Y$
- symmetry=  $-Z, X, -Y$
- symmetry=  $Y, Z, X$
- symmetry=  $-Y, Z, -X$
- symmetry=  $Y, -Z, -X$
- symmetry=  $-Y, -Z, X$
- symmetry=  $Y, X, Z$
- symmetry=  $-Y, -X, Z$
- symmetry=  $Y, -X, -Z$
- symmetry=  $-Y, X, -Z$
- symmetry=  $X, Z, Y$
- symmetry=  $-X, Z, -Y$
- symmetry=  $-X, -Z, Y$
- symmetry=  $X, -Z, -Y$
- symmetry=  $Z, Y, X$
- symmetry=  $Z, -Y, -X$
- symmetry=  $-Z, Y, -X$
- symmetry=  $-Z, -Y, X$
- symmetry=  $1/2+X, 1/2+Y, 1/2+Z$
- symmetry=  $1/2-X, 1/2-Y, 1/2+Z$
- symmetry=  $1/2-X, 1/2+Y, 1/2-Z$
- symmetry=  $1/2+X, 1/2-Y, 1/2-Z$
- symmetry=  $1/2+Z, 1/2+X, 1/2+Y$
- symmetry=  $1/2+Z, 1/2-X, 1/2-Y$
- symmetry=  $1/2-Z, 1/2-X, 1/2+Y$
- symmetry=  $1/2-Z, 1/2+X, 1/2-Y$
- symmetry=  $1/2+Y, 1/2+Z, 1/2+X$
- symmetry=  $1/2-Y, 1/2+Z, 1/2-X$
- symmetry=  $1/2+Y, 1/2-Z, 1/2-X$
- symmetry=  $1/2-Y, 1/2-Z, 1/2+X$
- symmetry=  $1/2+Y, 1/2+X, 1/2+Z$
- symmetry=  $1/2-Y, 1/2-X, 1/2+Z$
- symmetry=  $1/2+Y, 1/2-X, 1/2-Z$
- symmetry=  $1/2-Y, 1/2+X, 1/2-Z$
- symmetry=  $1/2+X, 1/2+Z, 1/2+Y$
- symmetry=  $1/2-X, 1/2+Z, 1/2-Y$
- symmetry=  $1/2-X, 1/2-Z, 1/2+Y$
- symmetry=  $1/2+X, 1/2-Z, 1/2-Y$
- symmetry=  $1/2+Z, 1/2+Y, 1/2+X$
- symmetry=  $1/2+Z, 1/2-Y, 1/2-X$
- symmetry=  $1/2-Z, 1/2+Y, 1/2-X$
- symmetry=  $1/2-Z, 1/2-Y, 1/2+X$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$  and  $y \leq x$  and  $z \leq y$

## 218 P-43n

- Number of Symmetry Operators = 24
- Space Group Name = P-43n
- Crystal System = CUBIC
- Laue Class =  $m\bar{3}m$
- Point Group =  $\bar{4}3m$
- Patterson Space Group # = [221](#)



- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= -X,Y,-Z
- symmetry= X,-Y,-Z
- symmetry= Z,X,Y
- symmetry= Z,-X,-Y
- symmetry= -Z,-X,Y
- symmetry= -Z,X,-Y
- symmetry= Y,Z,X
- symmetry= -Y,Z,-X
- symmetry= Y,-Z,-X
- symmetry= -Y,-Z,X
- symmetry=  $1/2+Y, 1/2+X, 1/2+Z$
- symmetry=  $1/2-Y, 1/2-X, 1/2+Z$
- symmetry=  $1/2+Y, 1/2-X, 1/2-Z$
- symmetry=  $1/2-Y, 1/2+X, 1/2-Z$
- symmetry=  $1/2+X, 1/2+Z, 1/2+Y$
- symmetry=  $1/2-X, 1/2+Z, 1/2-Y$
- symmetry=  $1/2-X, 1/2-Z, 1/2+Y$
- symmetry=  $1/2+X, 1/2-Z, 1/2-Y$
- symmetry=  $1/2+Z, 1/2+Y, 1/2+X$
- symmetry=  $1/2+Z, 1/2-Y, 1/2-X$
- symmetry=  $1/2-Z, 1/2+Y, 1/2-X$
- symmetry=  $1/2-Z, 1/2-Y, 1/2+X$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$  and  $z \leq \min(x,y)$

## 219 F-43c

- Number of Symmetry Operators = 96
- Space Group Name = F-43c
- Crystal System = CUBIC
- Laue Class = m-3m
- Point Group = -43m
- Patterson Space Group # = [225](#)
- Lattice Type = F
- symmetry= X,Y,Z
- {\*\*\*}
- symmetry= -X,-Y,Z
- symmetry= -X,Y,-Z
- symmetry= X,-Y,-Z
- symmetry= Z,X,Y
- symmetry= Z,-X,-Y
- symmetry= -Z,-X,Y
- symmetry= -Z,X,-Y
- symmetry= Y,Z,X
- symmetry= -Y,Z,-X
- symmetry= Y,-Z,-X
- symmetry= -Y,-Z,X
- symmetry=  $1/2+Y, 1/2+X, 1/2+Z$
- symmetry=  $1/2-Y, 1/2-X, 1/2+Z$
- symmetry=  $1/2+Y, 1/2-X, 1/2-Z$
- symmetry=  $1/2-Y, 1/2+X, 1/2-Z$
- symmetry=  $1/2+X, 1/2+Z, 1/2+Y$
- symmetry=  $1/2-X, 1/2+Z, 1/2-Y$
- symmetry=  $1/2-X, 1/2-Z, 1/2+Y$
- symmetry=  $1/2+X, 1/2-Z, 1/2-Y$

- symmetry=  $1/2+Z, 1/2+Y, 1/2+X$
- symmetry=  $1/2+Z, 1/2-Y, 1/2-X$
- symmetry=  $1/2-Z, 1/2+Y, 1/2-X$
- symmetry=  $1/2-Z, 1/2-Y, 1/2+X$
- symmetry=  $X, Y+1/2, Z+1/2$

{\*\*\*}

- symmetry=  $-X, -Y+1/2, Z+1/2$
- symmetry=  $-X, Y+1/2, -Z+1/2$
- symmetry=  $X, -Y+1/2, -Z+1/2$
- symmetry=  $Z, X+1/2, Y+1/2$
- symmetry=  $Z, -X+1/2, -Y+1/2$
- symmetry=  $-Z, -X+1/2, Y+1/2$
- symmetry=  $-Z, X+1/2, -Y+1/2$
- symmetry=  $Y, Z+1/2, X+1/2$
- symmetry=  $-Y, Z+1/2, -X+1/2$
- symmetry=  $Y, -Z+1/2, -X+1/2$
- symmetry=  $-Y, -Z+1/2, X+1/2$
- symmetry=  $1/2+Y, X, Z$
- symmetry=  $1/2-Y, -X, Z$
- symmetry=  $1/2+Y, -X, -Z$
- symmetry=  $1/2-Y, +X, -Z$
- symmetry=  $1/2+X, +Z, Y$
- symmetry=  $1/2-X, +Z, -Y$
- symmetry=  $1/2-X, -Z, Y$
- symmetry=  $1/2+X, -Z, -Y$
- symmetry=  $1/2+Z, +Y, X$
- symmetry=  $1/2+Z, -Y, -X$
- symmetry=  $1/2-Z, +Y, -X$
- symmetry=  $1/2-Z, -Y, X$
- symmetry=  $X+1/2, Y, Z+1/2$

{\*\*\*}

- symmetry=  $-X+1/2, -Y, Z+1/2$
- symmetry=  $-X+1/2, Y, -Z+1/2$
- symmetry=  $X+1/2, -Y, -Z+1/2$
- symmetry=  $Z+1/2, X, Y+1/2$
- symmetry=  $Z+1/2, -X, -Y+1/2$
- symmetry=  $-Z+1/2, -X, Y+1/2$
- symmetry=  $-Z+1/2, X, -Y+1/2$
- symmetry=  $Y+1/2, Z, X+1/2$
- symmetry=  $-Y+1/2, Z, -X+1/2$
- symmetry=  $Y+1/2, -Z, -X+1/2$
- symmetry=  $-Y+1/2, -Z, X+1/2$
- symmetry=  $Y, 1/2+X, Z$
- symmetry=  $-Y, 1/2-X, Z$
- symmetry=  $Y, 1/2-X, -Z$
- symmetry=  $-Y, 1/2+X, -Z$
- symmetry=  $X, 1/2+Z, Y$

symmetry=  $(-X, 1/2+Z, -Y$

- symmetry=  $-X, 1/2-Z, Y$
- symmetry=  $X, 1/2-Z, -Y$
- symmetry=  $Z, 1/2+Y, X$
- symmetry=  $Z, 1/2-Y, -X$
- symmetry=  $-Z, 1/2+Y, -X$
- symmetry=  $-Z, 1/2-Y, X$
- symmetry=  $X+1/2, Y+1/2, Z$

{\*\*\*}

- symmetry=  $-X+1/2, -Y+1/2, Z$
- symmetry=  $-X+1/2, Y+1/2, -Z$

- symmetry=  $X+1/2, -Y+1/2, -Z$
- symmetry=  $Z+1/2, X+1/2, Y$
- symmetry=  $Z+1/2, -X+1/2, -Y$
- symmetry=  $-Z+1/2, -X+1/2, Y$
- symmetry=  $-Z+1/2, X+1/2, -Y$
- symmetry=  $Y+1/2, Z+1/2, X$
- symmetry=  $-Y+1/2, Z+1/2, -X$
- symmetry=  $Y+1/2, -Z+1/2, -X$
- symmetry=  $-Y+1/2, -Z+1/2, X$
- symmetry=  $Y, X, 1/2+Z$
- symmetry=  $-Y, -X, 1/2+Z$
- symmetry=  $Y, -X, 1/2-Z$
- symmetry=  $-Y, X, 1/2-Z$
- symmetry=  $X, Z, 1/2+Y$
- symmetry=  $-X, Z, 1/2-Y$
- symmetry=  $-X, -Z, 1/2+Y$
- symmetry=  $X, -Z, 1/2-Y$
- symmetry=  $Z, Y, 1/2+X$
- symmetry=  $Z, -Y, 1/2-X$
- symmetry=  $-Z, Y, 1/2-X$
- symmetry=  $-Z, -Y, 1/2+X$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/4$  and  $-1/4 \leq z \leq 1/4$  and  $y \leq \min(x, 1/2-x)$  and  $-y \leq z \leq y$

## 220 I-43d

- Number of Symmetry Operators = 48
- Space Group Name = I-43d
- Crystal System = CUBIC
- Laue Class = m-3m
- Point Group = -43m
- Patterson Space Group # = [229](#)
- Lattice Type = I
- symmetry=  $X, Y, Z$
- {\*\*\*}
- symmetry=  $1/2-X, -Y, 1/2+Z$
- symmetry=  $-X, 1/2+Y, 1/2-Z$
- symmetry=  $1/2+X, 1/2-Y, -Z$
- symmetry=  $Z, X, Y$
- symmetry=  $1/2+Z, 1/2-X, -Y$
- symmetry=  $1/2-Z, -X, 1/2+Y$
- symmetry=  $-Z, 1/2+X, 1/2-Y$
- symmetry=  $Y, Z, X$
- symmetry=  $-Y, 1/2+Z, 1/2-X$
- symmetry=  $1/2+Y, 1/2-Z, -X$
- symmetry=  $1/2-Y, -Z, 1/2+X$
- symmetry=  $1/4+Y, 1/4+X, 1/4+Z$
- symmetry=  $1/4-Y, 3/4-X, 3/4+Z$
- symmetry=  $3/4+Y, 1/4-X, 3/4-Z$
- symmetry=  $3/4-Y, 3/4+X, 1/4-Z$
- symmetry=  $1/4+X, 1/4+Z, 1/4+Y$
- symmetry=  $3/4-X, 3/4+Z, 1/4-Y$
- symmetry=  $1/4-X, 3/4-Z, 3/4+Y$
- symmetry=  $3/4+X, 1/4-Z, 3/4-Y$
- symmetry=  $1/4+Z, 1/4+Y, 1/4+X$
- symmetry=  $3/4+Z, 1/4-Y, 3/4-X$
- symmetry=  $3/4-Z, 3/4+Y, 1/4-X$
- symmetry=  $1/4-Z, 3/4-Y, 3/4+X$

- symmetry=  $X+1/2, Y+1/2, Z+1/2$
- {\*\*\*}
- symmetry=  $-X, -Y+1/2, Z$
- symmetry=  $-X+1/2, Y, -Z$
- symmetry=  $X, -Y, -Z+1/2$
- symmetry=  $Z+1/2, X+1/2, Y+1/2$
- symmetry=  $Z, -X, -Y+1/2$
- symmetry=  $-Z, -X+1/2, Y$
- symmetry=  $-Z+1/2, X, -Y$
- symmetry=  $Y+1/2, Z+1/2, X+1/2$
- symmetry=  $-Y+1/2, Z, -X$
- symmetry=  $Y, -Z, -X+1/2$
- symmetry=  $-Y, -Z+1/2, X$
- symmetry=  $3/4+Y, 3/4+X, 3/4+Z$
- symmetry=  $3/4-Y, 1/4-X, 1/4+Z$
- symmetry=  $1/4+Y, 3/4-X, 1/4-Z$
- symmetry=  $1/4-Y, 1/4+X, 3/4-Z$
- symmetry=  $3/4+X, 3/4+Z, 3/4+Y$
- symmetry=  $1/4-X, 1/4+Z, 3/4-Y$
- symmetry=  $3/4-X, 1/4-Z, 1/4+Y$
- symmetry=  $1/4+X, 3/4-Z, 1/4-Y$
- symmetry=  $3/4+Z, 3/4+Y, 3/4+X$
- symmetry=  $1/4+Z, 3/4-Y, 1/4-X$
- symmetry=  $1/4-Z, 1/4+Y, 3/4-X$
- symmetry=  $3/4-Z, 1/4-Y, 1/4+X$
- asymm=  $1/4 \leq x \leq 1/2$  and  $1/4 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$  and  $z \leq \min(x, y)$

## 221 Pm-3m

- Number of Symmetry Operators = 48
- Space Group Name = Pm-3m
- Crystal System = CUBIC
- Laue Class = m-3m
- Point Group = m-3m
- Patterson Space Group # = [221](#)
- Lattice Type = P
- symmetry=  $X, Y, Z$
- symmetry=  $-X, -Y, Z$
- symmetry=  $-X, Y, -Z$
- symmetry=  $X, -Y, -Z$
- symmetry=  $Z, X, Y$
- symmetry=  $Z, -X, -Y$
- symmetry=  $-Z, -X, Y$
- symmetry=  $-Z, X, -Y$
- symmetry=  $Y, Z, X$
- symmetry=  $-Y, Z, -X$
- symmetry=  $Y, -Z, -X$
- symmetry=  $-Y, -Z, X$
- symmetry=  $Y, X, -Z$
- symmetry=  $-Y, -X, -Z$
- symmetry=  $Y, -X, Z$
- symmetry=  $-Y, X, Z$
- symmetry=  $X, Z, -Y$
- symmetry=  $-X, Z, Y$
- symmetry=  $-X, -Z, -Y$
- symmetry=  $X, -Z, Y$
- symmetry=  $Z, Y, -X$

- symmetry= Z,-Y,X
- symmetry= -Z,Y,X
- symmetry= -Z,-Y,-X
- symmetry= -X,-Y,-Z
- symmetry= X,Y,-Z
- symmetry= X,-Y,Z
- symmetry= -X,Y,Z
- symmetry= -Z,-X,-Y
- symmetry= -Z,X,Y
- symmetry= Z,X,-Y
- symmetry= Z,-X,Y
- symmetry= -Y,-Z,-X
- symmetry= Y,-Z,X
- symmetry= -Y,Z,X
- symmetry= Y,Z,-X
- symmetry= -Y,-X,Z
- symmetry= Y,X,Z
- symmetry= -Y,X,-Z
- symmetry= Y,-X,-Z
- symmetry= -X,-Z,Y
- symmetry= X,-Z,-Y
- symmetry= X,Z,Y
- symmetry= -X,Z,-Y
- symmetry= -Z,-Y,X
- symmetry= -Z,Y,-X
- symmetry= Z,-Y,-X
- symmetry= Z,Y,X
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$  and  $y \leq x$  and  $z \leq y$

## 222 Pn-3n

- Number of Symmetry Operators = 48
- Space Group Name = Pn-3n
- Crystal System = CUBIC
- Laue Class = m-3m
- Point Group = m-3m
- Patterson Space Group # = [221](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= -X,Y,-Z
- symmetry= X,-Y,-Z
- symmetry= Z,X,Y
- symmetry= Z,-X,-Y
- symmetry= -Z,-X,Y
- symmetry= -Z,X,-Y
- symmetry= Y,Z,X
- symmetry= -Y,Z,-X
- symmetry= Y,-Z,-X
- symmetry= -Y,-Z,X
- symmetry= Y,X,-Z
- symmetry= -Y,-X,-Z
- symmetry= Y,-X,Z
- symmetry= -Y,X,Z
- symmetry= X,Z,-Y
- symmetry= -X,Z,Y
- symmetry= -X,-Z,-Y

- symmetry= X,-Z,Y
- symmetry= Z,Y,-X
- symmetry= Z,-Y,X
- symmetry= -Z,Y,X
- symmetry= -Z,-Y,-X
- symmetry= -X,-Y,-Z
- symmetry= X,Y,-Z
- symmetry= X,-Y,Z
- symmetry= -X,Y,Z
- symmetry= -Z,-X,-Y
- symmetry= -Z,X,Y
- symmetry= Z,X,-Y
- symmetry= Z,-X,Y
- symmetry= -Y,-Z,-X
- symmetry= Y,-Z,X
- symmetry= -Y,Z,X
- symmetry= Y,Z,-X
- symmetry= -Y,-X,Z
- symmetry= Y,X,Z
- symmetry= -Y,X,-Z
- symmetry= Y,-X,-Z
- symmetry= -X,-Z,Y
- symmetry= X,-Z,-Y
- symmetry= X,Z,Y
- symmetry= -X,Z,-Y
- symmetry= -Z,-Y,X
- symmetry= -Z,Y,-X
- symmetry= Z,-Y,-X
- symmetry= Z,Y,X
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/2$  and  $y \leq x$  and  $z \leq y$

## 223 Pm-3n

- Number of Symmetry Operators = 48
- Space Group Name = Pm-3n
- Crystal System = CUBIC
- Laue Class = m-3m
- Point Group = m-3m
- Patterson Space Group # = [221](#)
- Lattice Type = P
- symmetry= X,Y,Z
- symmetry= -X,-Y,Z
- symmetry= -X,Y,-Z
- symmetry= X,-Y,-Z
- symmetry= Z,X,Y
- symmetry= Z,-X,-Y
- symmetry= -Z,-X,Y
- symmetry= -Z,X,-Y
- symmetry= Y,Z,X
- symmetry= -Y,Z,-X
- symmetry= Y,-Z,-X
- symmetry= -Y,-Z,X
- symmetry=  $1/2+Y, 1/2+X, 1/2-Z$
- symmetry=  $1/2-Y, 1/2-X, 1/2-Z$
- symmetry=  $1/2+Y, 1/2-X, 1/2+Z$
- symmetry=  $1/2-Y, 1/2+X, 1/2+Z$
- symmetry=  $1/2+X, 1/2+Z, 1/2-Y$

- symmetry=  $1/2-X, 1/2+Z, 1/2+Y$
- symmetry=  $1/2-X, 1/2-Z, 1/2-Y$
- symmetry=  $1/2+X, 1/2-Z, 1/2+Y$
- symmetry=  $1/2+Z, 1/2+Y, 1/2-X$
- symmetry=  $1/2+Z, 1/2-Y, 1/2+X$
- symmetry=  $1/2-Z, 1/2+Y, 1/2+X$
- symmetry=  $1/2-Z, 1/2-Y, 1/2-X$
- symmetry=  $-X, -Y, -Z$
- symmetry=  $X, Y, -Z$
- symmetry=  $X, -Y, Z$
- symmetry=  $-X, Y, Z$
- symmetry=  $-Z, -X, -Y$
- symmetry=  $-Z, X, Y$
- symmetry=  $Z, X, -Y$
- symmetry=  $Z, -X, Y$
- symmetry=  $-Y, -Z, -X$
- symmetry=  $Y, -Z, X$
- symmetry=  $-Y, Z, X$
- symmetry=  $Y, Z, -X$
- symmetry=  $1/2-Y, 1/2-X, 1/2+Z$
- symmetry=  $1/2+Y, 1/2+X, 1/2+Z$
- symmetry=  $1/2-Y, 1/2+X, 1/2-Z$
- symmetry=  $1/2+Y, 1/2-X, 1/2-Z$
- symmetry=  $1/2-X, 1/2-Z, 1/2+Y$
- symmetry=  $1/2+X, 1/2-Z, 1/2-Y$
- symmetry=  $1/2+X, 1/2+Z, 1/2+Y$
- symmetry=  $1/2-X, 1/2+Z, 1/2-Y$
- symmetry=  $1/2-Z, 1/2-Y, 1/2+X$
- symmetry=  $1/2-Z, 1/2+Y, 1/2-X$
- symmetry=  $1/2+Z, 1/2-Y, 1/2-X$
- symmetry=  $1/2+Z, 1/2+Y, 1/2+X$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $0 \leq z \leq 1/4$  and  $z \leq \min(x, 1/2-x, y, 1/2-y)$

## 224 Pn-3m

- Number of Symmetry Operators = 48
- Space Group Name = Pn-3m
- Crystal System = CUBIC
- Laue Class = m-3m
- Point Group = m-3m
- Patterson Space Group # = [221](#)
- Lattice Type = P
- symmetry=  $X, Y, Z$
- symmetry=  $-X, -Y, Z$
- symmetry=  $-X, Y, -Z$
- symmetry=  $X, -Y, -Z$
- symmetry=  $Z, X, Y$
- symmetry=  $Z, -X, -Y$
- symmetry=  $-Z, -X, Y$
- symmetry=  $-Z, X, -Y$
- symmetry=  $Y, Z, X$
- symmetry=  $-Y, Z, -X$
- symmetry=  $Y, -Z, -X$
- symmetry=  $-Y, -Z, X$
- symmetry=  $1/2+Y, 1/2+X, 1/2-Z$
- symmetry=  $1/2-Y, 1/2-X, 1/2-Z$
- symmetry=  $1/2+Y, 1/2-X, 1/2+Z$

- symmetry=  $1/2-Y, 1/2+X, 1/2+Z$
- symmetry=  $1/2+X, 1/2+Z, 1/2-Y$
- symmetry=  $1/2-X, 1/2+Z, 1/2+Y$
- symmetry=  $1/2-X, 1/2-Z, 1/2-Y$
- symmetry=  $1/2+X, 1/2-Z, 1/2+Y$
- symmetry=  $1/2+Z, 1/2+Y, 1/2-X$
- symmetry=  $1/2+Z, 1/2-Y, 1/2+X$
- symmetry=  $1/2-Z, 1/2+Y, 1/2+X$
- symmetry=  $1/2-Z, 1/2-Y, 1/2-X$
- symmetry=  $1/2-X, 1/2-Y, 1/2-Z$
- symmetry=  $1/2+X, 1/2+Y, 1/2-Z$
- symmetry=  $1/2+X, 1/2-Y, 1/2+Z$
- symmetry=  $1/2-X, 1/2+Y, 1/2+Z$
- symmetry=  $1/2-Z, 1/2-X, 1/2-Y$
- symmetry=  $1/2-Z, 1/2+X, 1/2+Y$
- symmetry=  $1/2+Z, 1/2+X, 1/2-Y$
- symmetry=  $1/2+Z, 1/2-X, 1/2+Y$
- symmetry=  $1/2-Y, 1/2-Z, 1/2-X$
- symmetry=  $1/2+Y, 1/2-Z, 1/2+X$
- symmetry=  $1/2-Y, 1/2+Z, 1/2+X$
- symmetry=  $1/2+Y, 1/2+Z, 1/2-X$
- symmetry=  $-Y, -X, Z$
- symmetry=  $Y, X, Z$
- symmetry=  $-Y, X, -Z$
- symmetry=  $Y, -X, -Z$
- symmetry=  $-X, -Z, Y$
- symmetry=  $X, -Z, -Y$
- symmetry=  $X, Z, Y$
- symmetry=  $-X, Z, -Y$
- symmetry=  $-Z, -Y, X$
- symmetry=  $-Z, Y, -X$
- symmetry=  $Z, -Y, -X$
- symmetry=  $Z, Y, X$
- asymm=  $0 \leq x \leq 1/2$  and  $0 \leq y \leq 1/2$  and  $-1/4 \leq z \leq 1/4$  and  $y \leq x$  and  $\max(x-1/2, -y) \leq z \leq \min(1/2-x, y)$

## 225 Fm-3m

- Number of Symmetry Operators = 192
- Space Group Name = Fm-3m
- Crystal System = CUBIC
- Laue Class = m-3m
- Point Group = m-3m
- Patterson Space Group # = [225](#)
- Lattice Type = F
- symmetry=  $X, Y, Z$
- symmetry=  $-X, -Y, Z$
- symmetry=  $-X, Y, -Z$
- symmetry=  $X, -Y, -Z$
- symmetry=  $Z, X, Y$
- symmetry=  $Z, -X, -Y$
- symmetry=  $-Z, -X, Y$
- symmetry=  $-Z, X, -Y$
- symmetry=  $Y, Z, X$
- symmetry=  $-Y, Z, -X$
- symmetry=  $Y, -Z, -X$
- symmetry=  $-Y, -Z, X$
- symmetry=  $Y, X, -Z$



- symmetry=  $-Y, -X, -Z$
- symmetry=  $Y, -X, Z$
- symmetry=  $-Y, X, Z$
- symmetry=  $X, Z, -Y$
- symmetry=  $-X, Z, Y$
- symmetry=  $-X, -Z, -Y$
- symmetry=  $X, -Z, Y$
- symmetry=  $Z, Y, -X$
- symmetry=  $Z, -Y, X$
- symmetry=  $-Z, Y, X$
- symmetry=  $-Z, -Y, -X$
- symmetry=  $-X, -Y, -Z$
- symmetry=  $X, Y, -Z$
- symmetry=  $X, -Y, Z$
- symmetry=  $-X, Y, Z$
- symmetry=  $-Z, -X, -Y$
- symmetry=  $-Z, X, Y$
- symmetry=  $Z, X, -Y$
- symmetry=  $Z, -X, Y$
- symmetry=  $-Y, -Z, -X$
- symmetry=  $Y, -Z, X$
- symmetry=  $-Y, Z, X$
- symmetry=  $Y, Z, -X$
- symmetry=  $-Y, -X, Z$
- symmetry=  $Y, X, Z$
- symmetry=  $-Y, X, -Z$
- symmetry=  $Y, -X, -Z$
- symmetry=  $-X, -Z, Y$
- symmetry=  $X, -Z, -Y$
- symmetry=  $X, Z, Y$
- symmetry=  $-X, Z, -Y$
- symmetry=  $-Z, -Y, X$
- symmetry=  $-Z, Y, -X$
- symmetry=  $Z, Y, X$
- symmetry=  $X, 1/2 + Y, 1/2 + Z$
- symmetry=  $-X, 1/2 - Y, 1/2 + Z$
- symmetry=  $-X, 1/2 + Y, 1/2 - Z$
- symmetry=  $X, 1/2 - Y, 1/2 - Z$
- symmetry=  $Z, 1/2 + X, 1/2 + Y$
- symmetry=  $Z, 1/2 - X, 1/2 - Y$
- symmetry=  $-Z, 1/2 - X, 1/2 + Y$
- symmetry=  $-Z, 1/2 + X, 1/2 - Y$
- symmetry=  $Y, 1/2 + Z, 1/2 + X$
- symmetry=  $-Y, 1/2 + Z, 1/2 - X$
- symmetry=  $Y, 1/2 - Z, 1/2 - X$
- symmetry=  $-Y, 1/2 - Z, 1/2 + X$
- symmetry=  $Y, 1/2 + X, 1/2 - Z$
- symmetry=  $-Y, 1/2 - X, 1/2 - Z$
- symmetry=  $Y, 1/2 - X, 1/2 + Z$
- symmetry=  $-Y, 1/2 + X, 1/2 + Z$
- symmetry=  $X, 1/2 + Z, 1/2 - Y$
- symmetry=  $-X, 1/2 + Z, 1/2 + Y$
- symmetry=  $-X, 1/2 - Z, 1/2 - Y$
- symmetry=  $X, 1/2 - Z, 1/2 + Y$
- symmetry=  $Z, 1/2 + Y, 1/2 - X$
- symmetry=  $Z, 1/2 - Y, 1/2 + X$
- symmetry=  $-Z, 1/2 + Y, 1/2 + X$

- symmetry=  $-Z, 1/2-Y, 1/2-X$
- symmetry=  $-X, 1/2-Y, 1/2-Z$
- symme