

```
cs=crystalSymmetry('432')
```

```
cs = crystalSymmetry
```

```
symmetry: 432  
elements: 24  
a, b, c : 1, 1, 1
```

```
ori_euler=orientation.byEuler([0 0 0]*degree,cs)
```

```
ori_euler = orientation (432 → xyz)
```

```
Bunge Euler angles in degree  
phi1  Phi phi2  
0     0     0
```

pre-defined standard orientations

```
cube=orientation.cube(cs)
```

```
cube = orientation (432 → xyz)
```

```
Bunge Euler angles in degree  
phi1  Phi phi2  
0     0     0
```

```
brass=orientation.brass(cs)
```

```
brass = orientation (432 → xyz)
```

```
Bunge Euler angles in degree  
phi1  Phi phi2  
35    45    0
```

```
copper=orientation.copper(cs)
```

```
copper = orientation (432 → xyz)
```

```
Bunge Euler angles in degree  
phi1  Phi  phi2  
90    35.2644  45
```

```
goss=orientation.goss(cs)
```

```
goss = orientation (432 → xyz)
```

```
Bunge Euler angles in degree
```

```
phi1  Phi phi2  
0    45    0
```

```
% Bunge Euler angles in degree  
% phi1  Phi phi2  
%      0  45    0  
% goss = orientation (432 → xyz)
```

symmetry in orientations

```
cube_sym=brass.symmetrise
```

```
cube_sym = orientation (432 → xyz)  
size: 24 x 1
```

```
show Euler angles
```

```
% Bunge Euler angles in degree  
% phi1  Phi phi2  
%    35   45    0  
%   125   90   45  
%   215   45   90  
%   215  135   90  
%   305   90   45  
%    35  135    0  
%    35   45   90  
%   125   90  135  
%   215   45  180  
%   215  135  180  
%   305   90  135  
%    35  135   90  
%    35   45  180  
%   125   90  225  
%   215   45  270  
%   215  135  270  
%   305   90  225  
%    35  135  180  
%    35   45  270  
%   125   90  315  
%   215   45    0  
%   215  135    0  
%   305   90  315  
%    35  135  270
```

```
ucube_sym=unique(cube_sym, 'noSymmetry')
```

```
ucube_sym = orientation (432 → xyz)
size: 24 x 1
```

show Euler angles

```
% Bunge Euler angles in degree
%   phi1  Phi phi2
%    125   90   45
%    305   90  225
%    215  135    0
%     35  135  180
%     35  135   90
%    215  135  270
%    215   45    0
%     35   45  180
%     35  135  270
%    215  135   90
%     35  135    0
%    215  135  180
%     35   45   90
%    215   45  270
%    305   90  315
%    125   90  135
%    305   90  135
%    125   90  315
%    305   90   45
%    125   90  225
%    215   45   90
%     35   45  270
%     35   45    0
%    215   45  180
```

2. by orientation matrix

```
ori_mat=[1 0 0; 0 1 0; 0 0 1]
```

```
ori_mat = 3×3
    1     0     0
    0     1     0
    0     0     1
```

```
ori_matrix=orientation.byMatrix(ori_mat,cs)
```

```
ori_matrix = orientation (432 → xyz)
```

```
Bunge Euler angles in degree
phi1  Phi phi2
    0    0    0
```

```
ori_euler.matrix
```

```
ans = 3×3
    1.0000    -0.0000         0
    0.0000     1.0000         0
         0         0     1.0000
```

misorientation

```
ang=angle(ori_matrix,ori_euler)./degree
```

```
ang = 0
```

```
axis(ori_matrix,ori_euler)
```

```
ans = vector3d
    x y z
    1 0 0
```

```
mis_ori=inv(cube)*brass
```

```
mis_ori = misorientation (432 → 432)
```

```
Bunge Euler angles in degree
phi1  Phi phi2
    35    45     0
```

```
mis_ang=mis_ori.angle./degree
```

```
mis_ang = 56.4446
```

```
mis_axis=round(mis_ori.axis)
```

```
mis_axis = Miller (432)
    h k l
    4 9 12
```

```
% mis_ori = misorientation (432 → 432)
%
% (001) || (001)    [010] || [010]
```

symmetry in misorientation

```
mis_ori_sym=mis_ori.symmetrise;
```

```
mis_ori_sym = misorientation (432 → 432)
size: 576 x 1
```

```
show Euler angles
```

```
mis_ang_list=mis_ori_sym.angle('noSymmetry')./degree
```

```
mis_ang_list = 576x1
    56.4446
   172.9334
    69.9322
   140.3140
    90.4352
   137.1883
   129.4960
   125.9320
    56.4446
   137.1883
```

```
mis_axis_list=round(mis_ori_sym.axis('noSymmetry'))
```

```
mis_axis_list = Miller (432)
size: 576 x 1

show Miller
```

```
mis_axis_list=round(mis_ori_sym.axis())
```

```
mis_axis_list = Miller (432)
size: 576 x 1

show Miller
```