

## Copilot

The d-block elements, also known as transition metals, span groups 3 to 12 in the periodic table. Their valencies can vary widely due to the involvement of d-orbitals in bonding. Here's a summary of the common valencies for these elements, organized by group:

### Group 3

- **Scandium (Sc):** +3
- **Yttrium (Y):** +3
- **Lanthanum (La):** +3 (sometimes considered part of the f-block)

### Group 4

- **Titanium (Ti):** +4, +3
- **Zirconium (Zr):** +4
- **Hafnium (Hf):** +4

### Group 5

- **Vanadium (V):** +5, +4, +3, +2
- **Niobium (Nb):** +5, +3
- **Tantalum (Ta):** +5

### Group 6

- **Chromium (Cr):** +6, +3, +2
- **Molybdenum (Mo):** +6, +4
- **Tungsten (W):** +6

### Group 7

- **Manganese (Mn):** +7, +4, +2
- **Technetium (Tc):** +7, +4
- **Rhenium (Re):** +7, +4

### Group 8

- **Iron (Fe):** +3, +2
- **Ruthenium (Ru):** +3, +4, +8
- **Osmium (Os):** +4, +8

### Group 9

- **Cobalt (Co):** +3, +2
- **Rhodium (Rh):** +3
- **Iridium (Ir):** +3, +4

### Group 10

- **Nickel (Ni):** +2, +3
- **Palladium (Pd):** +2, +4
- **Platinum (Pt):** +2, +4

### Group 11

- **Copper (Cu):** +2, +1
- **Silver (Ag):** +1
- **Gold (Au):** +3, +1

## Group 12

- **Zinc (Zn):** +2
- **Cadmium (Cd):** +2
- **Mercury (Hg):** +2, +1

These valencies are typical, but many of these elements can exhibit other oxidation states depending on the chemical environment.

If you need more detailed information or specific examples, feel free to ask! How's your exam preparation going?