

13.2 First-row d-block elements (Transition elements)



- d-block elements have many half-filled 3d orbitals
- Across the block, decrease in atomic radii is small because of small increase in effective charge experienced by outer 4s
- Increase in nuclear charge due to added protons is offset by the addition of electron in the inner 3d sub-level
- This is why they can form alloys, because the atoms can be replaced easily without disruption to the solid structure
- Small range in first ionization energies is caused by small increase in effective nuclear charge

- Properties:
 - a) High electrical and thermal conductivity
 - b) High melting point
 - c) Malleable (shape)
 - d) High tensile strength (stretch)
 - e) Ductile (drawn into wires)
- Why
 - Strong metallic bonding
 - Delocalised electron. 3d and 4s electrons are close together and involved in bonding therefore form the delocalized sea of electrons

- Chemical Properties:
 - Form compounds with more than one oxidation number
 - Form many complex ions
 - Form coloured compounds
 - Acts as catalyst when either elements or compounds