Chemistry Formula Sheet

Chapter by chapter, topic by topic. Written by the PadhoNa team for quick revision.

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CHAPTER 23

d and f Block Elements

Properties of transition elements

MAGNETIC MOMENT

$$\mu = \sqrt{n(n+2)}\ \text{BM}$$

coloured ions (d–d transitions); variable oxidation states; catalytic activity

COMMON STATES

Mn: up to $+7$; Sc^{3+}, Ti^{4+}, Zn^{2+}, Cu^{+} colourless

$KMnO_4$ and $K_2Cr_2O_7$

$$MnO_4^- + 8H^+ + 5e^- \rightarrow Mn^{2+} + 4H_2O$$

$$Cr_2O_7^{2-} + 14H^+ + 6e^- \rightarrow 2Cr^{3+} + 7H_2O$$

$Cr_2O_7^{2-}$ (orange) $\rightleftharpoons$ CrO_4^{2-} (yellow) as pH rises

Lanthanoids and actinoids

LANTHANOID CONTRACTION

steady fall in size (poor shielding by 4f); Zr and Hf have almost equal radii

common state $+3$; Ce^{4+} oxidant, Eu^{2+} reductant

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