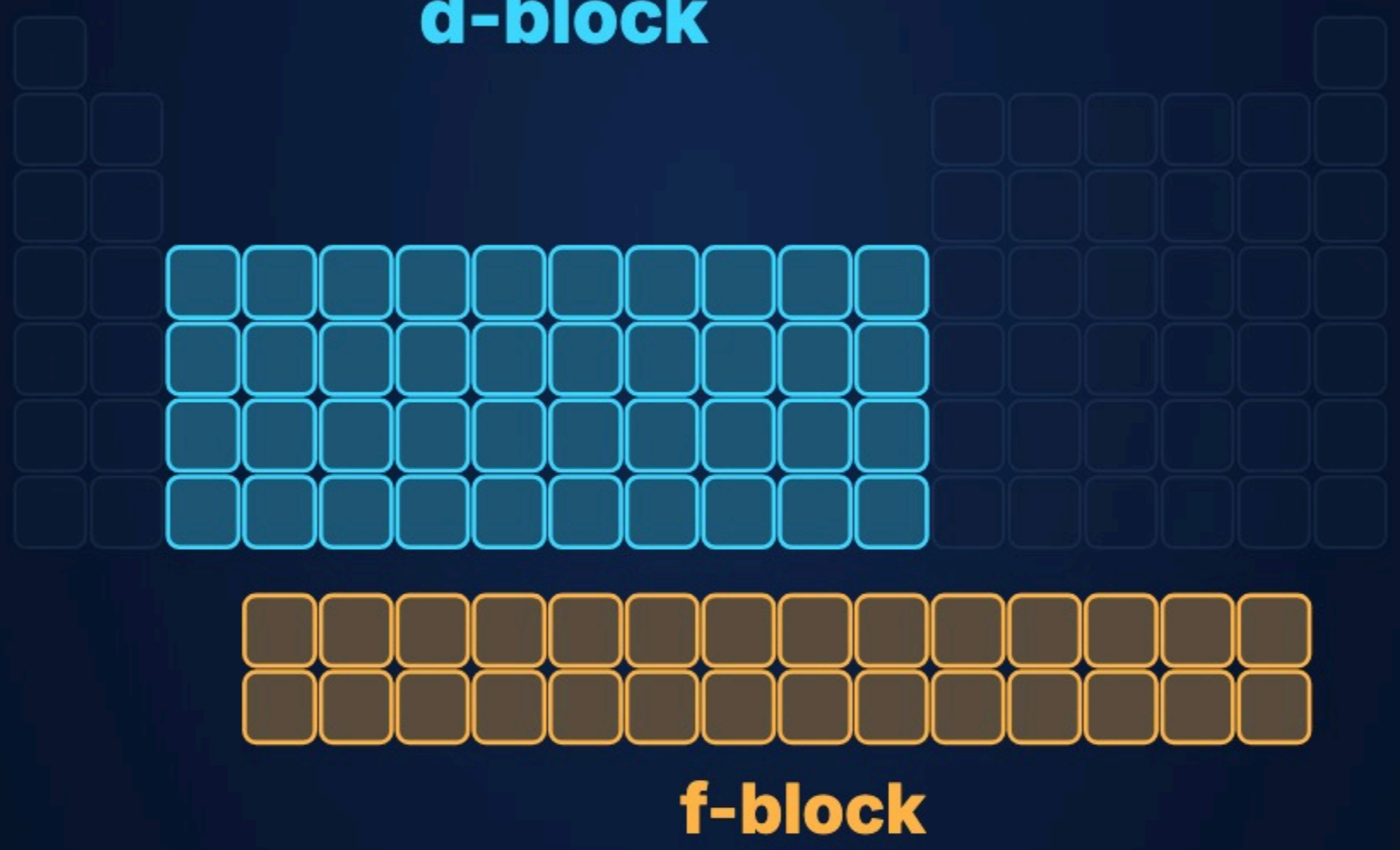
The d- and f-Block Elements



Class 12 Chemistry · Chapter 4

Memory cards: the chapter in 7 cards

Where are they?

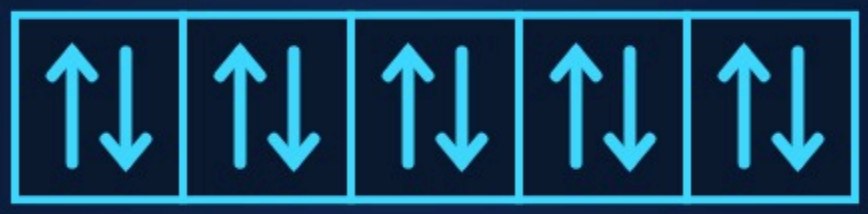


d-block: the middle of the periodic table, **groups 3–12**.

f-block: two separate rows at the bottom: **lanthanoids** (4f) and **actinoids** (5f).

Why these names?

d orbitals



f orbitals



In the **d-block**, electrons fill the **d orbitals** (5 orbitals, up to 10 electrons).

In the **f-block**, they fill the **f orbitals** (7 orbitals, up to 14 electrons).

Why are they special?

Oxidation states

many: Mn from +2 to +7

Colour

coloured compounds

Magnetism

paramagnetic ions

Catalysts

speed up reactions

Transition metals show **variable oxidation states**, form **coloured compounds**, are often **paramagnetic** and are good **catalysts**.

Around you



$CuSO_4$ $KMnO_4$ $K_2Cr_2O_7$

Iron (Fe) in bridges and steel; **copper (Cu)** in electric wires.

Blue copper sulphate, purple potassium permanganate, orange potassium dichromate: all compounds of d-block metals.

In this chapter

1 Electronic configuration (and the Cr, Cu exceptions)

2 General properties: size, ionisation, oxidation states, E°, magnetism, colour, complexes, catalysis, alloys

3 Two key compounds: $K_2Cr_2O_7$ and $KMnO_4$

4 Lanthanoids and actinoids (lanthanoid contraction)

Remember: the middle of the periodic table = metals, colours and catalysts.

Quick check



?

Zinc is in the d-block. Is zinc a transition metal?

Hint: look at its d subshell. Answer in the next video.