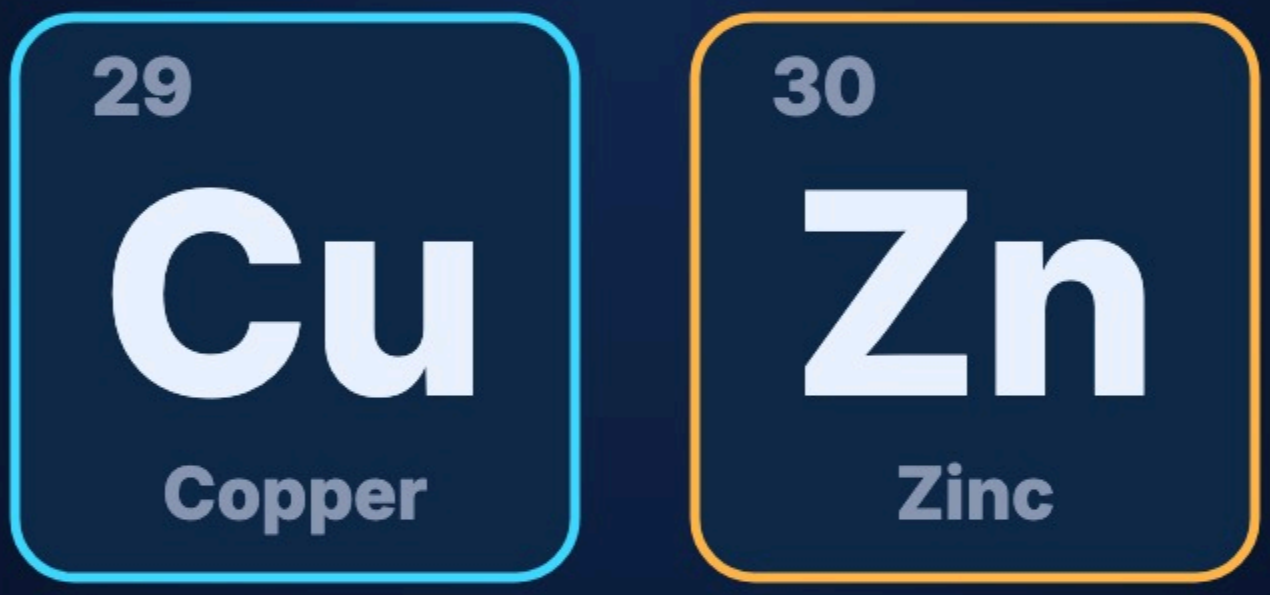
What makes an element a transition element?



Both are in the d-block. Only one is a transition metal.

The d- and f-Block Elements · NCERT 4.1

The rule



d subshell ADHURA

A **transition element** has an **incompletely filled d subshell** in its atom **or** in any of its common ions (oxidation states).

Iron: $3d^6\ 4s^2$



6 / 10

Six of ten d places filled: **incomplete**.

✓ **Iron is a transition metal.**

Copper: full in the atom, not in the ion



Cu atom: $3d^{10}\ 4s^{1}$ (d full). But Cu^{2+}: $3d^{9}$, incomplete.

✓ Copper is a transition metal.

Zinc: always full



Zn atom: $3d^{10}\ 4s^2$; Zn^{2+}: $3d^{10}$. The d subshell is never incomplete.

✗ Zinc is not a transition metal.

Group 12: d-block, not transition

30	48	80
Zn	Cd	Hg
Zinc	Cadmium	Mercury

Zn, Cd and Hg have a full $(n-1)d^{10}$ subshell in the atom and in their common ions, so they are **not regarded as transition metals**.

Remember: incomplete d subshell = transition metal.

Quick check



?

Sc^{3+} has $3d^0$. Is scandium a transition metal?

Hint: check the atom too ($3d^1\ 4s^2$).