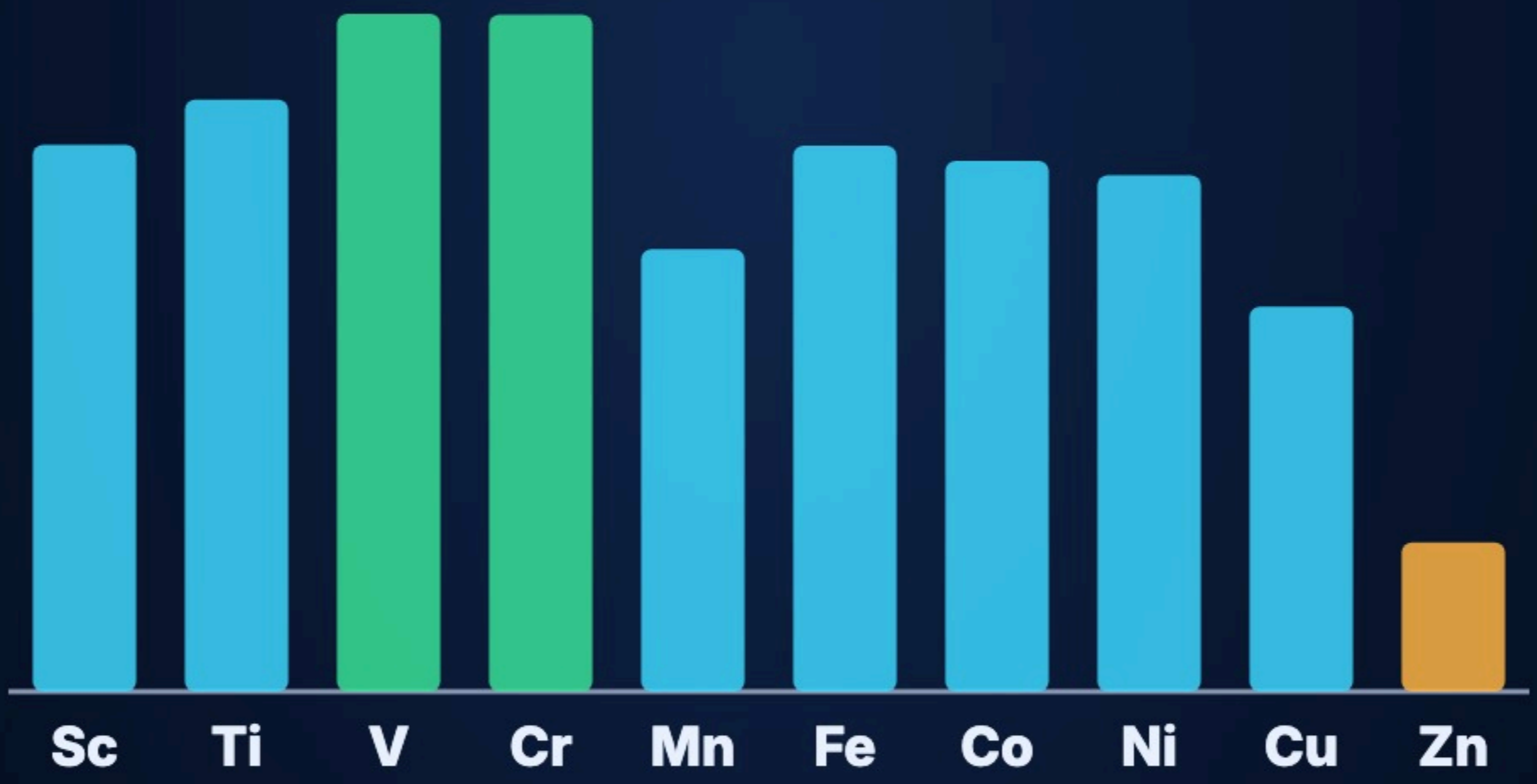
Why do transition metals melt so high?



Tungsten melts at 3422 °C; a bulb filament glows near 3000 °C.

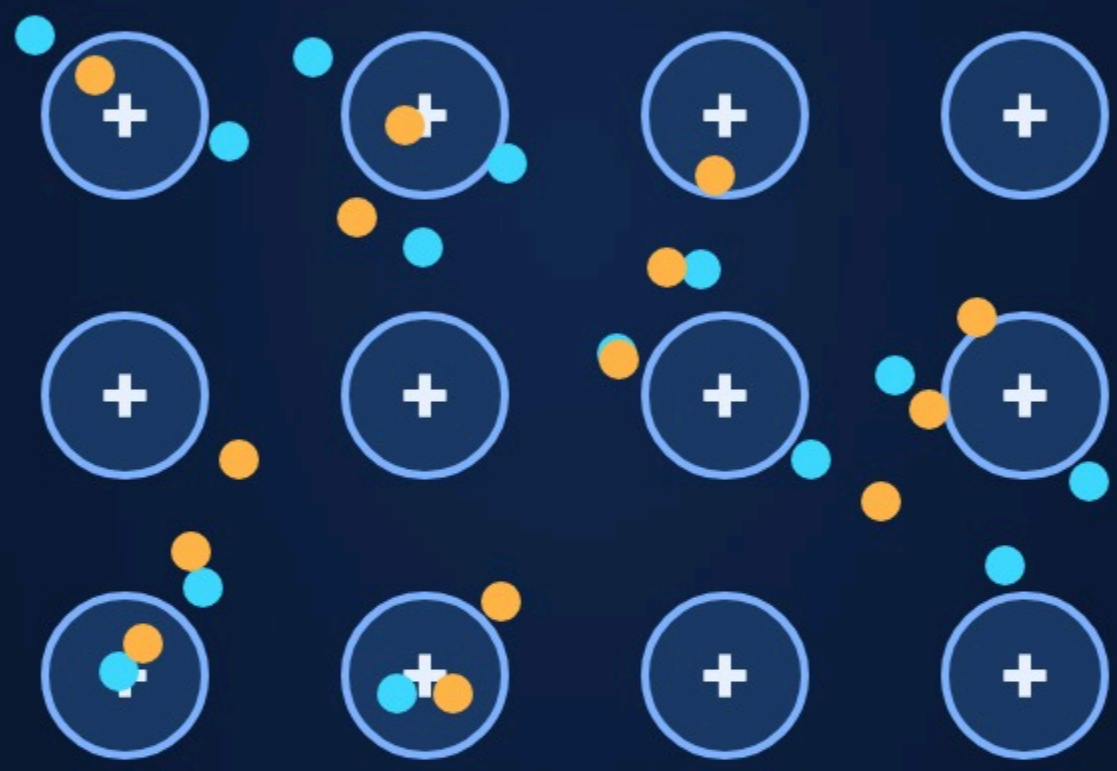
The d- and f-Block Elements · NCERT 4.3.1

Metallic bonding



Metal atoms release their outer electrons into a "sea" that holds the positive ions together.

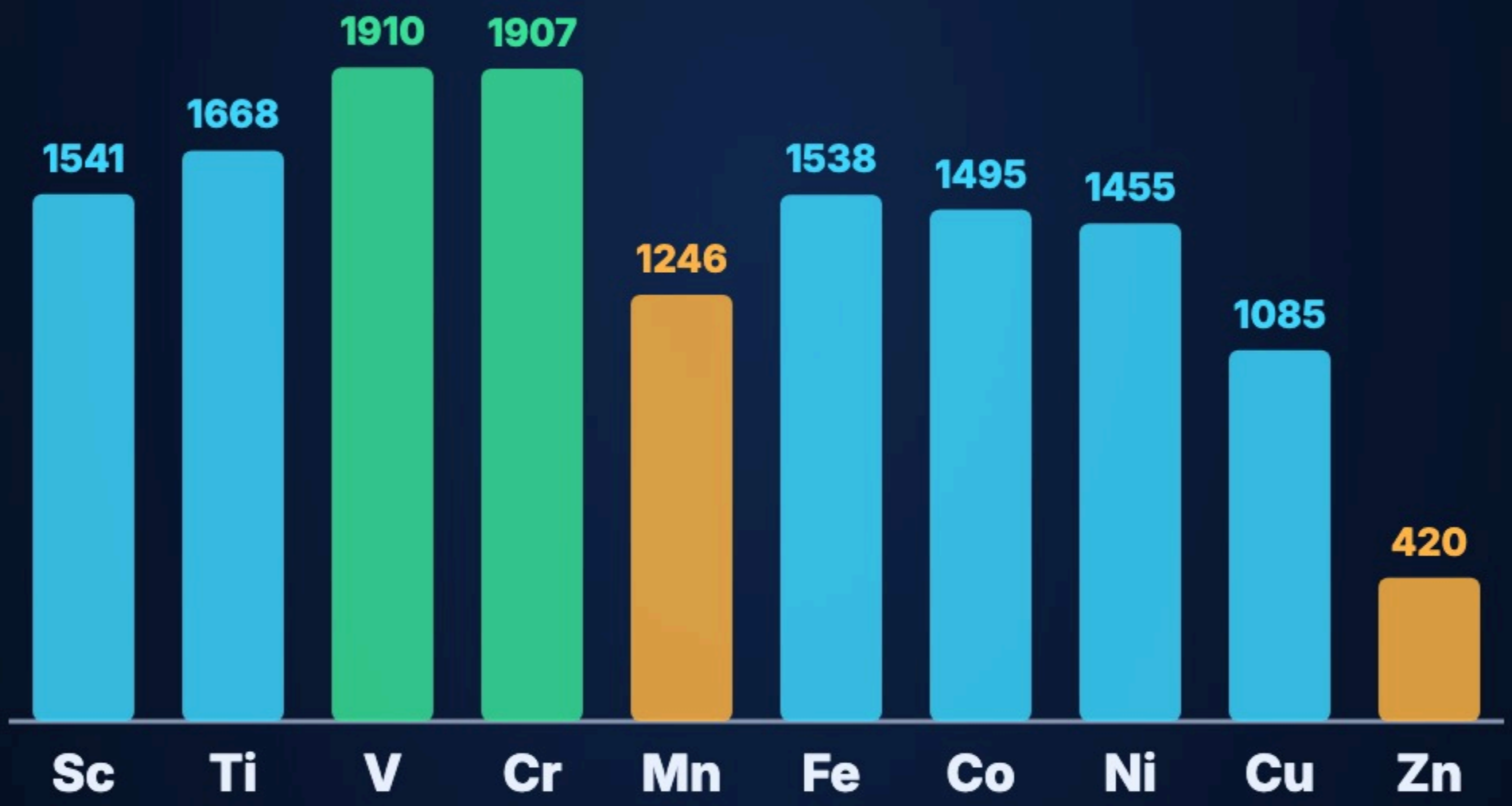
d electrons join the sea



In transition metals, **(n−1)d electrons** join the **ns electrons** in metallic bonding.

More electrons → stronger metallic bonds → higher melting point.

3d series: melting points (°C)



Rises to a **maximum in the middle** (V, Cr), then falls. **Mn** is an exception (lower).

Zinc, cadmium, mercury: low



d^{10}: no unpaired d electron

Zn 420 °C **Cd 321 °C**

Hg −39 °C (liquid)

A full d^{10} subshell gives weaker metallic bonding, so group 12 metals melt low.

Remember

More d electrons in bonding

↓

Stronger metallic bond

↓

Higher melting point (and hardness)

Transition metals (except Zn, Cd, Hg) are hard, with low volatility and high melting and boiling points.

Quick check

?

24	74
Cr	W
Chromium	Tungsten

Tungsten (5d) sits below chromium (3d). Which melts higher?

Hint: look again at the first card.