3.2.4 Properties of Period 3 Elements and Their Oxides

★ A-LEVEL ONLY — not examined at AS level

3.2.4	*Period 3 elements and oxides: reactions with oxygen, melting points, reactions of oxides with water, reactions with acids/bases.*

Reactions with O■: Na■O, MgO, Al■O■, SiO■, P■O■■, SO■/SO■.

Melting points: Na■O, MgO, Al■O■ = giant ionic (high m.p.; MgO highest due to Mg^{2}■/O^{2}■ charges). SiO■ = giant covalent (very high m.p.). P■O■■, SO■, SO■ = simple molecular (low m.p.).

Reactions with water: Na■O + H■O → 2NaOH (pH ~14). MgO + H■O → Mg(OH)■ (pH ~9). Al■O■: insoluble (amphoteric). SiO■: insoluble.

P■O■■ + 6H■O → 4H■PO■ (pH ~1). SO■ + H■O → H■SO■ (pH ~2). SO■ + H■O → H■SO■ (pH ~1).

Trend: metal oxides = basic/amphoteric; non-metal oxides = acidic.

Al■O■ is amphoteric: dissolves in both acid and alkali.