

27 Thermal stability – Part 1

Name: _____ Class: _____ Date: _____

Vocabulary

Write each word three times.

English	Write it 3 times (English)
thermal stability	_____
cation	_____
anion	_____
polarisation	_____

Recall

The **thermal stability** _____ of the Group 2 nitrates and carbonates increases down the group. Here is why.

New ideas

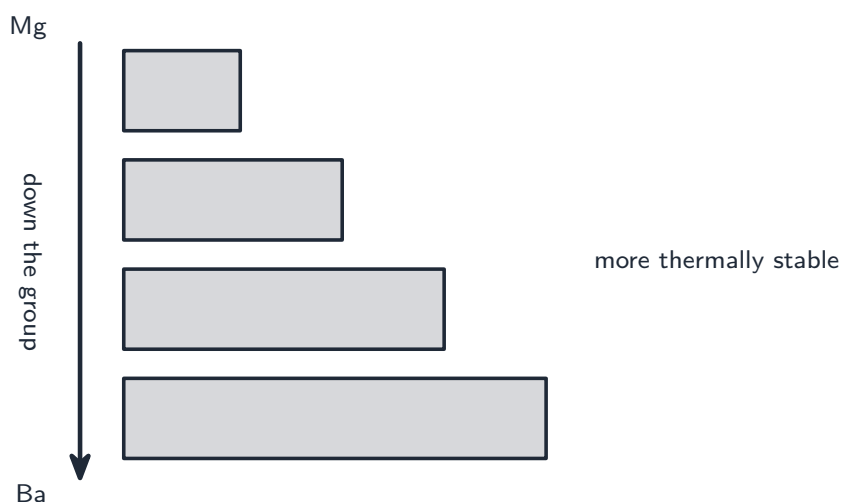
Read these first, then do the Practice.

■ 1 Polarisation



A small **cation** has a high charge density, so it distorts (polarises) the large **anion** – **polarisation** – weakening a bond inside it. A bigger cation polarises less.

■ 2 The trend



Going down the group the cation gets larger, so it polarises the anion less. The compound is harder to break down – more thermally stable.

Watch out: a *small*, highly-charged cation polarises the anion *most*, making the compound *least* stable. Going down the group the cation gets bigger and polarises less, so stability *increases*.

Practice

Try these in order.

27.1 What does a small *cation* do to a large anion? [1]

27.2 What is this distorting called? [1]

27.3 Why does a bigger cation polarise less? [1]

27.4 Does thermal stability increase or decrease down the group? [1]

27.5 Which is more thermally stable – magnesium carbonate or barium carbonate? [1]

27.6 Challenge. Lithium carbonate decomposes more easily than sodium carbonate, even though both are Group 1. Explain why, using polarisation. [2]
