27 Thermal stability – Part 1

Name: _____ Class: _____ Date: _____

Vocabulary 词汇

Write each word three times. 把每个单词抄写三遍。

English	中文	Write it 3 times (English)		
thermal stability	热稳定性			
cation	阳离子			
anion	阴离子			
polarisation	极化			

Recall

The **thermal stability** 热稳定性 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

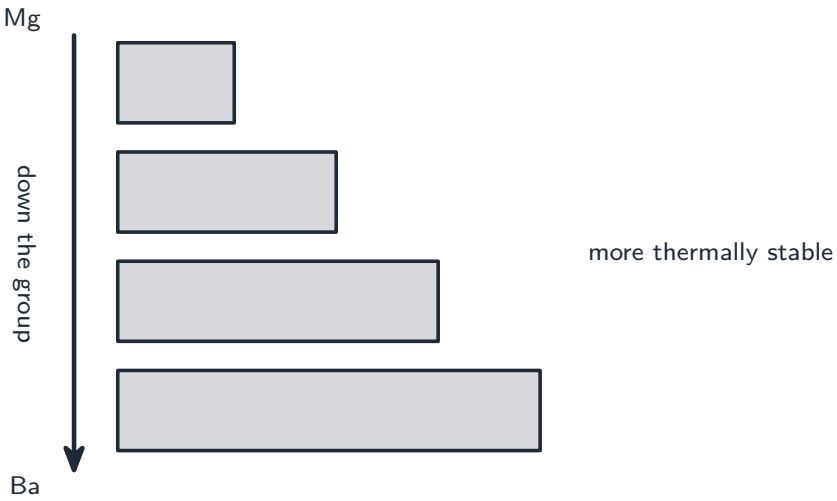
small cation:
distorts a lot

big cation:
barely distorts

A small **cation** 阳离子 has a high charge density, so it distorts (polarises) the large

anion 阴离子 — **polarisation** 极化 — 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]