

18.3 Calcium carbonate

What are carbonates?

- Carbonates are compounds that contain the carbonate ion, CO_3^{2-} .
- The rocks **limestone**, **chalk**, and **marble** are all mainly calcium carbonate (CaCO_3).
- Limestone and chalk were formed over millions of years, under the ocean, from shells and skeletons of sea creatures. High pressure converted some limestone to marble.

Test for carbonates in rock

- Drip acid onto a sample of the rock.
- If it fizzes, the rock contains a carbonate. (The fizz is due to carbon dioxide gas.)

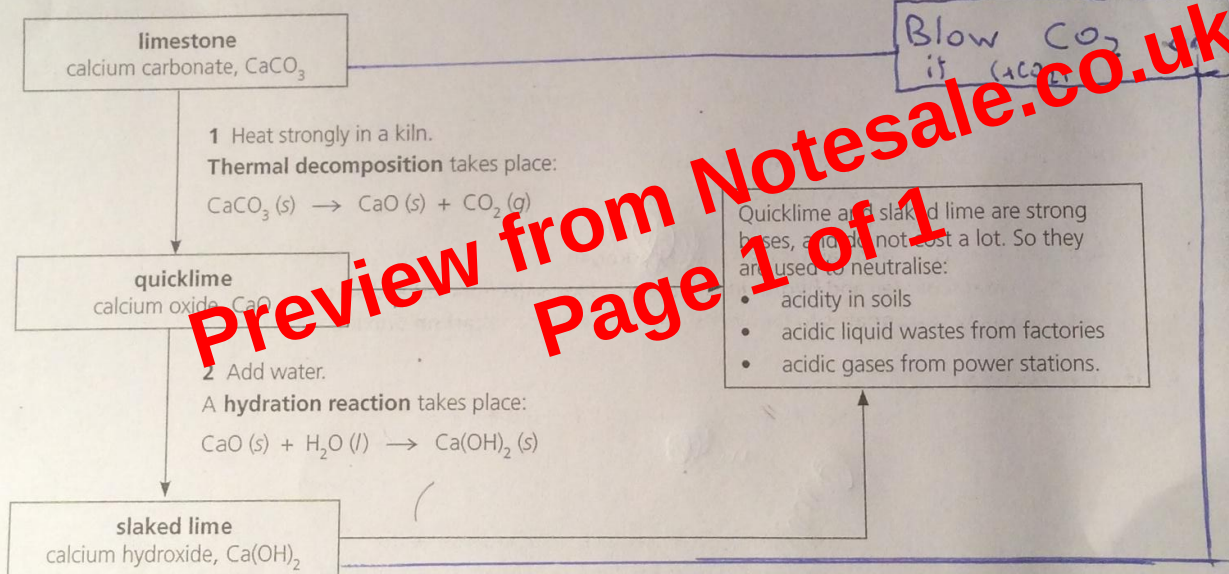
Uses of limestone

Limestone is mined at quarries. It has many uses:

Where it is used	What for?
in the steel industry	to remove acidic impurities when extracting iron and making steel (pages 118 – 119)
in the building industry	to make cement ; limestone is heated with clay, then gypsum (calcium sulfate) is added
on the farm	to neutralise acidity in soil (page 86)
at the power station	to remove acidic flue gases such as sulfur dioxide, produced when the sulfur compounds in fossil fuels burn; the removal of sulfur dioxide from flue gases is called desulfurisation

Quicklime and slaked lime

Limestone is also a **raw material** for two other important chemicals:



Quick check for 18.3

(Answers on page 169)

- What is the formula of the carbonate ion? CO_3^{2-}
- Name three rocks that contain calcium carbonate. *Limestone, Chalk, marble*
- Name three uses of limestone which rely on its ability to react with acids. *In the steel industry, on a farm, at a power station*
- How is cement manufactured from limestone? *Heated with clay*
- How does *slaked lime* differ chemically from *quicklime*? *Slaked lime also has H_2O*
- Calcium hydroxide is often chosen for *desulfurisation*.
 - What does the term in *italics* mean? *The process for removing acids*
 - Why is calcium hydroxide suitable? *Because it removes calcium hydroxide*