

# WJEC (Wales) Chemistry

# GCSE

## 1.6 - Limestone

### Flashcards

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What is the trend in stabilities of the metal carbonates?



# What is the trend in stabilities of the metal carbonates?

The more reactive a metal is, the more stable its metal carbonate is



# What happens when metal carbonates are heated?



# What happens when metal carbonates are heated?

They undergo thermal decomposition to form their metal oxide and carbon dioxide



What is the relationship between stability and thermal decomposition?



# What is the relationship between stability and thermal decomposition?

The more stable the metal carbonate is, the longer it will take for the compound to undergo thermal decomposition



What is the chemical name for limestone?





# What is the chemical name for limestone?

Calcium carbonate



What is the chemical name for quicklime?



# What is the chemical name for quicklime?

Calcium oxide



What is the chemical name for slaked lime?



# What is the chemical name for slaked lime?

Calcium hydroxide (solid)



What are the four reactions in the limestone cycle?



# What are the four reactions in the limestone cycle?

- Thermal decomposition of limestone into quicklime and  $\text{CO}_2$
- Quicklime and water form slaked lime, an alkali
- Slaked lime dissolves in excess water and forms limewater
- When  $\text{CO}_2$  is bubbled through limewater, limestone is formed, thus completing the cycle



Which reaction in the limestone cycle is endothermic?





# Which reaction in the limestone cycle is endothermic?

Thermal decomposition of limestone, as heat is taken in as limestone decomposes



Which reaction in the limestone cycle is exothermic?



# Which reaction in the limestone cycle is exothermic?

Quicklime plus water forming slaked lime, an alkali

This reaction gives out heat to the surroundings



# What are the uses of limestone?



# What are the uses of limestone?

- Building material for statues, buildings and roads
- For making cement
- For making iron
- Added to soil as a fertiliser



# How is limestone used to make iron?



# How is limestone used to make iron?

- Coal, iron ore and limestone are heated in a blast furnace
- The main impurity in the mixture is silicon dioxide (sand)
- Limestone undergoes thermal decomposition forming calcium oxide
- The calcium oxide reacts with the silicon dioxide to form solid calcium silicate which can be removed from the furnace



# How is limestone used to make cement?





# How is limestone used to make cement?

- Crushed limestone is heated in a rotary kiln with clay which produces cement
- Cement can be used as it is or added to sand and water to make mortar
- Cement can also be used to make concrete by adding sand, water and gravel



# How is limestone used in soil?



# How is limestone used in soil?

Limestone is added to soil to neutralise acidity. This improves the growth of crops.



What are the advantages of quarrying for limestone?



# What are the advantages of quarrying for limestone?

- Easiest way to obtain limestone, which is a valuable material
- Quarrying provides jobs
- Once the quarry is no longer used it can be turned into something else, such as a new lake
- Improves local roads due to the need for large transport vehicles



# What are the disadvantages of limestone quarrying?



# What are the disadvantages of limestone quarrying?

- Destroys large areas of land, including animal habitats
- Causes noise and visual pollution
- Dust and pollution from extra vehicles can cause respiratory problems such as asthma

