

PURITY OF LIMESTONES

Purpose

To determine whether there is a relationship between the colour of a limestone and the amount of impurities it contains.

Limestone has more uses than any other rock and for many of those uses (cement, toothpaste) it is important to know the purity.

(This experiment will only catch those impurities which are insoluble in 2M HCl. Other carbonates and some sulphides and oxides will be dissolved.)

Instructions

- 1 Take one bag of limestone chips and remove the large piece of limestone. Note its number and match its colour against the rock colour chart if there is one.*
- 2 Weigh out accurately a quantity of limestone, about 10 grams.*
- 3 Write your name and sample number on the beaker.*
- 4 Place the chips in the beaker and add 50ml of acid.*
- 5 Write your name and sample number on the edge of the filter paper and weigh it.*
- 6 When the sample has stopped fizzing add a further 20ml of acid. If no further fizzing occurs then the CaCO_3 has all been dissolved.*
- 7 Now filter the contents of the beaker and carefully wash all the contents on to the filter paper.*
- 8 Once all the water has passed through the filter paper carefully take it out of the funnel, fold it so no sediment can escape and place it to dry.*
- 9 When it has dried weigh the filter paper again and calculate the percentage of impurities.*

$$\frac{\text{Weight of paper + solids} - \text{weight of paper}}{\text{Weight of limestone}} \times 100$$

10 *Compare your results with other members of the class and draw your conclusions.*

Teacher's Section

Requirements

You will need a variety of limestones of different colours: white, cream and several shades of grey. You should have one large piece say 5cm by 5cm plus several small chips.

A 100ml beaker and small funnel, retort stand to hold funnel, filter paper, wash bottle of distilled water, 2 molar hydrochloric acid.

Access to balance which will measure to 0.1g.

Oven (optional).

Rock colour chart (optional).

Notes

The limestones can be chipped in a crusher or by hammering them inside a piece of cloth.

If you do not have a rock colour chart then a paint colour chart will do, or else put them in order of increasing darkness.

Filter papers are best dried in an oven, but can be dried on a radiator or window sill.

Results

Generally the darker the limestone the more impure it is.

Time

30 minutes.