

COOLING AND CRYSTAL SIZE

Purpose

To show the relationship between speed of cooling and crystal size.

Activity

Draw up a table like this with three empty lines.

<i>Temperature of slides</i>	<i>Time of crystallisation</i>	<i>number of centres</i>	<i>sizes of crystals</i>	<i>Average size of crystals</i>

- 1. Choose a pair of slides at room temperature.*
- 2. Put one slide in the centre of the black piece of paper.*
- 3. Use the glass rod to put a drop of salol on the slide and then immediately put the other slide on top and squeeze it down.*
- 4. Label the slide with the temperature and your initials.*
- 5. Start the timer as soon as the first crystals appear.*
- 6. Make a diagram to show where the crystals start to grow.*
- 7. Watch the process of crystallisation and draw several diagrams to illustrate the way the crystals grow and meet each other. Describe the process of crystallisation. Turn the timer off when crystallisation is complete.*
- 8. Examine the slide and record the grain size of the ten largest crystals or all if less than ten.*
- 9. Repeat with the other pairs of slides. Try to make the size of the drop of salol the same each time.*
- 10. Plot the range of crystal sizes in each slide against temperature of the slide.*

Teacher's Section

Requirements

Melted salol. (phenyl salicylic) Do not over heat, Melt in a water bath at 60°C.

For each pair of students:

2 slides at room temperature

2 slides at 5°C (use a fridge) or 0°C (use ice)

2 slides at 30°C use an oven or the top of a radiator

The slides should be 5cm by 5cm glass slides. Alternatively use petri dishes or pieces of 2mm glass.

Timer

Glass rod

Pen for writing on glass

Hand lenses and grain size scale.

An A5 piece of black paper (makes the crystal growth easier to see)

Notes

This activity is best done if it is tied in with rock samples with different grain sizes for instance samples taken across a dyke.

Speed of crystallisation is dependent on the size of the drop of salol so as far as possible the drops should be the same size. It is also dependant on the initial temperature of the salol.

If the room temperature slides take a long time to crystallise then omit the warm slides. The salol on the cold slide may crystallise too quickly to be timed and with too fine a grain to be measured.

The glass slides can be reused if washed in hot water. It is useful to keep examples of slides which have crystallised well.

Time

30 minutes

Results

Crystallisation usually begins on the edges. The crystals grow as expanding circles until they touch each other. The cooler slides crystallise more rapidly. The crystals are often finer at the edges.

Cost

Salol £12 for 250g