14–16 years

Cool it

ROYAL SOCIETY OF CHEMISTRY

Education
Inspiring your teaching and learning

https://rsc.li/3JoTSyi

Learning objectives

1. Describe and explain the changes that take place during an endothermic reaction.
2. Devise a method to lower the temperature of water at room temperature to 6.5°C.
3. Write an investigation report including what you did, your results and conclusion.

The problem: statement one

Keeping people and things cool is an essential part of modern living.

The problem: statement two

Keeping things cool contributes to global warming.

The problem: statement three

As our climate warms, we will see more extremes of weather.

How do we keep things cool without contributing to global warming?

Questions

1. Give two ways in which cooling technology contributes to global warming.
2. Define an endothermic reaction.
3. The reaction between citric acid and sodium hydrogencarbonate is endothermic. Predict how the temperature of the surroundings will change during the reaction.
4. Sketch a reaction profile for the reaction between citric acid and sodium hydrogencarbonate.

   Explain the shape of your profile.

Investigating cooling

Using the samples of citric acid and sodium hydrogencarbonate provided devise a method of reducing the temperature of water to 6.5°C.

- The temperature should be reached 1 minute after the reaction starts.
- In planning this activity, you should consider health and safety.

Check your plans with your teacher before starting the experiment.

Investigation

Investigation write up

Your task

When you have completed the practical work, write up your investigation report including what you did, your results and your conclusion.

Use the following headings:

- Problem
- Method
- Results
- Conclusion