

Method 3 (carbon dioxide)

Aim:

Observing the production of carbon dioxide gas from chemical raising agents.

Equipment

- Digital scales
- 5 measuring jugs or tall glasses
- Kettle
- Additional measuring jug
- Digital timer / stopwatch / clock with a second hand

Ingredients

- Bicarbonate of soda
- Hot water (freshly boiled)
- Cold water
- Baking powder
- Cream of tartar

Method

- **Control** – Weigh 5g of bicarbonate of soda into a measuring jug or tall glass, and add 30ml freshly boiled water from the kettle. Watch what happens and time the reaction.

Repeat the above experiment with the following variations:

- **Variation 1** – Weigh 5g of bicarbonate of soda into a measuring jug or tall glass, and add 30ml cold water. Watch what happens and time the reaction.
- **Variation 2** – Weigh 5g of baking powder into a measuring jug or tall glass, and add 30ml freshly boiled water from the kettle. Watch what happens and time the reaction.
- **Variation 3** – Weigh 5g of baking powder into a measuring jug or tall glass, and add 30ml cold water. Watch what happens and time the reaction.
- **Variation 4** – Weigh 5g of bicarbonate of soda and 5g cream of tartar into a measuring jug or tall glass, and add 30ml freshly boiled water from the kettle. Watch what happens and time the reaction.
- **Variation 5** – Weigh 5g of bicarbonate of soda and 5g cream of tartar into a measuring jug or tall glass, and add 30ml cold water. Watch what happens and time the reaction.

Results

Compare your findings in the table below:

Control	Variation 1	Variation 2	Variation 3	Variation 4	Variation 5

Conclusions

Summarise your findings here. You should consider:

Which sample produced the greatest amount of bubbles? (This bubbling effect is referred to as effervescence.)

Explain the reactions taking place, and relate this to how this knowledge is useful when cooking.

Control

Variation 1

Variation 2

Variation 3

Variation 4

Variation 5

Extension task

Find a video for making honeycomb, and watch the honeycomb being made. Write a description of the chemical changes that take place.

Ask your teacher if they will demonstrate making honeycomb to your class. **WARNING: hot sugar burns – it needs to be made under carefully controlled conditions and by an adult who is aware of the health and safety issues when working with caramel.**