

Lab: Decomposition of Baking Soda

Background: sodium bicarbonate (commonly called baking soda) is used extensively in many food products. Baking soda is used to prepare cakes in order to ensure that cakes “rise” as they bake. As the temperature of the cake batter reaches approximately 50°C, baking soda decomposes and carbon dioxide is released.

There are three possible chemical reactions that could be occurring during that baking process. All three of these reactions shown below are theoretically possible, yet only one actually occurs.

- sodium bicarbonate (s) \rightarrow sodium hydroxide (s) + carbon dioxide (g)
- sodium bicarbonate (s) \rightarrow sodium oxide (s) + carbon dioxide (g) + water (g)
- sodium bicarbonate (s) \rightarrow sodium carbonate (s) + carbon dioxide (g) + water (g)

Your task: perform an experiment to determine which of the above reactions takes place when baking soda decomposes.

- Record procedure, data, calculations, and conclusion into your composition notebook.
- Create and submit ONE Google Lab Sheet per lab group.

Materials available:

- Baking soda (s)
- Balance
- Bunsen burner
- Clay triangle
- Crucible
- Crucible tongs
- Ring stand
- Ring
- Scoopula

Hints to help you:

- Do not fill crucibles more than half-full
- Gases will leave the crucible