Mass changes in chemical reactions – student sheet

In this experiment, you will be doing two chemical reactions to see whether any mass changes occur.

Instructions

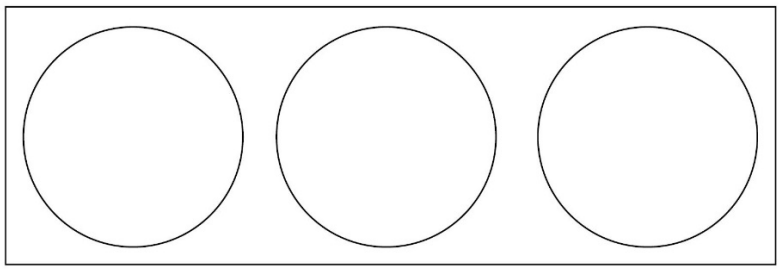
Part 1: the reaction between sodium carbonate and calcium nitrate

1. Put two plastic pipettes containing the solutions of sodium carbonate and calcium nitrate in the outer two wells of the mini well-plate (see the diagram below).
2. Place on a balance and record the mass.
3. Put 20 drops of sodium carbonate solution into the middle well followed by 20 drops of calcium nitrate solution.
4. Record any changes you see and write an equation for the reaction.
5. Reweigh the complete apparatus and record the mass. Is there a difference in the masses before and after the reaction? Explain your answer.

Part 2: the reaction between marble and hydrochloric acid

1. Place one piece of marble chip and the pipette containing the hydrochloric acid in two of the wells in the mini well-plate.
2. Add ten drops of hydrochloric acid to the well containing the marble chip.
3. Record any changes you see and write an equation for the reaction.
4. When the reaction has finished reweigh the complete apparatus and record the mass. How do your answers compare with those in part 1? Explain your answers.

Mini well-plate diagram



Health, safety and technical notes

1. Wear eye protection throughout.
2. Cut a three-well plate from the standard 24-well plate using a hacksaw. A class set can be cut from a single well-plate.
3. Sodium carbonate, $Na_2CO_3.10H_2O$, 0.5 mol dm^{-3} is of low hazard at this concentration.
4. Calcium nitrate, $Ca(NO_3)_2.4H_2O$, 0.5 mol dm^{-3} is of low hazard.
5. Hydrochloric acid, HCl(aq), 1 mol dm^{-3} is of low hazard.