

## What causes anomalous results?

### *Education in Chemistry*

April 2018

[rsc.li/2qFN2M4](https://www.rsc.li/2qFN2M4)

#### 1. Separations: salt from rock salt (11–14)

Students mixed rock salt with water. They poured the rock salt and water mixture through filter paper into an evaporating basin. They then heated the evaporating basin with a Bunsen burner.

Consider the effect on the mass of the final sample in the following situations. Put a tick in the relevant box and be prepared to justify your answer.

	<b>More mass</b>	<b>Same mass</b>	<b>Less mass</b>
The rock salt wasn't well crushed			
Less water was added			
More water was added			
There was a hole in the filter paper			
The evaporating basin and salt solution was heated too strongly			
The evaporating basin and salt solution wasn't heated for long enough			

## 2. Rate of reaction: a reaction that produces a gas (14–16)

A student put a piece of magnesium ribbon with dilute hydrochloric acid in a conical flask. They connected it to an inverted boiling tub in a trough of water. They measured the time it takes to fill the boiling tube with hydrogen gas produced from the reaction between the magnesium and acid.

Consider the effect on the time taken to fill a boiling tube with gas in the following situations. Put a tick in the relevant box and be prepared to justify your answer.

	<b>More time</b>	<b>Same time</b>	<b>Less time</b>
The student cut the magnesium ribbon into multiple pieces before dropping them into the flask			
The bung wasn't placed on the conical flask quick enough			
The tubing wasn't properly under the test tube at the start of the reaction			
The flask was shaken from side to side during the reaction			
The flask was held in one of the student's hands during the reaction			

### 3. Energy changes: zinc added to copper sulfate

Students added pieces of zinc to a copper(II) sulfate solution in an insulated cup. The cup had a lid with a hole to hold a thermometer. They measured the temperature rise.

Consider the effect on the temperature rise when zinc is added to copper sulfate in the following situations. Put a tick in the relevant box and be prepared to justify your answer.

	Higher temp.	Same temp.	Lower temp.
The lid wasn't put back on the cup when the zinc was added			
The bulb of the thermometer wasn't fully submerged in the solution			
The thermometer was wiggled around in the cup			
The cup was supported with a glass beaker			
The students spilt some zinc when transferring to the cup			
The cup was wet when the copper sulfate was added			
The students didn't read the thermometer at eye level			