

Combined Science - Chemistry - Key Stage 4

Energy Changes

Required Practical - Temperature Change Part 1

Mrs. Begum



Graph paper



Independent task 1 - variables

1. What are we changing? (independent variable)
2. What are we measuring? (dependent variable)
3. What are we keeping the same? (control variables)



Independent task 1 - answers

1. What are we changing? (independent variable)
The volume of alkali added
2. What are we measuring (dependent variable)
The temperature increase
3. What are we keeping the same (control variables)
Concentration of alkali, concentration of acid, volume of acid



Independent task 2

Explain why these steps were taken:

1. A polystyrene cup was used
2. The polystyrene cup was placed in the beaker
3. The lid was used to cover the cup
4. The experiment was repeated



Independent task 2 - answers

Explain why these steps were taken:

1. A polystyrene cup was used.

To reduce heat loss to the surroundings

2. The polystyrene cup was placed in the beaker.

To make it more stable, so it didn't fall over

3. The lid was used to cover the cup.

To reduce heat loss to the surroundings from the surface

4. Repeats were done.

To identify anomalies and calculate the mean



Independent task 3

Identify the anomalies and calculate the mean maximum temperature.

| Total volume of sodium hydroxide (cm ³) | Maximum temperature (°C) | | | Mean |
|---|--------------------------|-----|-----|------|
| | 1st | 2nd | 3rd | |
| 5 | 22 | 23 | 22 | |
| 10 | 24 | 30 | 24 | |
| 15 | 26 | 27 | 25 | |
| 20 | 29 | 29 | 28 | |
| 25 | 32 | 33 | 34 | |
| 30 | 34 | 35 | 36 | |
| 35 | 33 | 31 | 32 | |
| 40 | 29 | 22 | 29 | |
| 45 | 27 | 26 | 28 | |



Independent task 3

- answers

Identify the anomalies and calculate the mean maximum temperature.

| Total volume of sodium hydroxide (cm ³) | Maximum temperature (°C) | | | Mean |
|---|--------------------------|-----|-----|-----------|
| | 1st | 2nd | 3rd | |
| 5 | 22 | 23 | 22 | 22 |
| 10 | 24 | 30 | 24 | 24 |
| 15 | 26 | 27 | 25 | 26 |
| 20 | 29 | 29 | 28 | 29 |
| 25 | 32 | 33 | 34 | 33 |
| 30 | 34 | 35 | 36 | 35 |
| 35 | 33 | 31 | 32 | 32 |
| 40 | 29 | 22 | 29 | 29 |
| 45 | 27 | 26 | 28 | 27 |



Graph

Plot a graph for these results

| Total volume of sodium hydroxide (cm ³) | Mean |
|---|-----------|
| 5 | 22 |
| 10 | 24 |
| 15 | 26 |
| 20 | 29 |
| 25 | 33 |
| 30 | 35 |
| 35 | 32 |
| 40 | 29 |
| 45 | 27 |



Graph

