PRACTICAL TECHNIQUES FOR TOPIC 4

1. **Carrying out an enthalpy change (not combustion)**

* **Add one reactant to a polystyrene cup inside a glass beaker**
* **Use a lid**
* **Record the initial temperature over a three minute period**
* **Add the second reactant and record the temperature change over a ten minute period**
* **Stir the mixture continuously**

Techniques for good accuracy

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| Technique | Reason |
| Taking the initial temperature for three minutes before adding the second reactant | Plot a line to show the trend in ambient temperature |
| Use a polystyrene cup, with a glass beaker for support | Polystyrene is a good insulator with a low heat capacity. The glass beaker stops the cup falling over |
| Use a lid | Prevents heat loss |
| Record the temperature change over a ten minute period | To all the solution time to cool, so a cooling curve can be plotted |
| Stir continuously | To Ensure thorough mixing of all reactants |

**Sources of error**

* Heat capacity of cup and thermometer
* Heat loss through the sides and lid of container

1. **Carrying out an enthalpy change of combustion**

* **Weigh the spirit burner with the lid on**
* **Add a measured quantity of water to a copper can**
* **Record the initial temperature of the water**
* **Light the spirit burner and heat the water up**
* **Put out the spirit burner by putting the lid back on**
* **Record the final temperature of the water**
* **Weigh the spirit burner again with the lid on**

Techniques for good accuracy

|  |  |
| --- | --- |
| Technique | Reason |
| Keep a small distance between burner and can | Reduce heat loss between burner and can |
| Surround the apparatus with a windshield | Reduce heat loss between burner and can |
| Use a copper can | It is a good conductor of heat |
| Lag the copper can | Reduce heat loss through the sides of the can |
| Use a large volume of water | Reduce the temperature change, so reduce heat loss by evaporation |
| Put out the spirit burner by putting the lid on | Stop smoke escaping after the reaction has been stopped |

**Sources of error**

* Heat loss between burner and can
* Heat loss through the sides of the can
* Heat loss through water surface