

WJEC (Wales) Chemistry A-level

SP 2.1b - Determination of an Enthalpy Change of Combustion

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SP 2.1b - Determination of an Enthalpy Change of Combustion

Aim

Determination of the **enthalpy change of combustion** of methanol and ethanol.

Apparatus and Chemicals

- Deionised water
- Access to a 3 decimal place digital balance (minimum 2 decimal place)
- Clamp stand
- 250 cm³ conical flask
- Spirit burner
- Heatproof mat
- Thermometer
- CH₃OH
- CH₃CH₂OH

Safety Considerations

- ★ CH₃CH₂OH - highly flammable
- ★ CH₃OH - highly flammable, toxic



Method

1. Add 100 cm³ of deionised water to a 250 cm³ conical flask.
2. Clamp the conical flask to a stand at a suitable height so that the spirit burner can be placed below it.
3. Weigh a **spirit burner and lid** containing methanol using a mass balance and record the mass.
4. Record the **initial temperature** of the water using the thermometer.
5. Place the spirit burner under the conical flask and light the wick.
6. Allow the flame to heat the water by around 40 °C.
7. Replace the cap to extinguish the flame.
8. Record the **final temperature** of the water.
9. Re-weigh the spirit burner and lid and record in your table.
10. Calculate the mass of alcohol used.
11. Repeat steps 1 through to 10 for ethanol.
12. Determine the **energy released** by each alcohol and calculate the **enthalpy change** of combustion - $\Delta_c H^\ominus$.

