

Investigating temperature changes on evaporation of liquids – teacher notes

Topic

Scientific methodology.

Timing

10 min

Description

In this experiment students use the thermometer strip to examine temperature changes when drops of water, ethanol and ethoxyethane are placed on it.

Apparatus

- Student worksheet
- Temperature strip
- Pipettes

Chemicals

- Ethoxyethane (diethyl ether)
- Deionised water
- Ethanol

(NB Do not use propanone for this experiment – it attacks the temperature strip)

Observations

Water, which forms well-defined droplets, produces very little, if any, change in temperature since the rate of evaporation is slow due to the high degree of hydrogen bonding.

With ethanol, the drops spread out and a fall in temperature will be noted due to the higher rate of evaporation. With ethoxyethane the drops evaporate very quickly and a marked drop in temperature is observed. This is consistent with the low boiling point and absence of hydrogen bonding between the molecules.

The energy changes accompanying changes of state are an important concept in science. One example is the addition of ice to cool drinks. Here it is the melting of ice that cools the drink rather than the contact of ice with the liquid.

Health, safety and technical notes

- Read our standard health and safety guidance here <https://rsc.li/3LNbkfo>
- Students must wear eye protection.
- Ethoxyethane (diethyl ether) and Ethanol are both highly FLAMMABLE (see CLEAPSS Hazcard [HC042](#), [HC040a](#)).
- Ethoxyethane is also a respiratory irritant and harmful if swallowed.