Chemistry 20

Unit A: Matter and chemical bonding

Molecular substances in daily life

Sugar and a cleaner share a pattern

- Table sugar is sucrose, formula $C_{12}H_{22}O_{11}$, a molecular solid in food.
- Some cleaners use ethanol, C_2H_6O, a small molecular liquid.



Materials and evidence

- Resins, rubber-like plant materials, polymers, and solvents are molecular cases outside the beaker.
- A melting plan needs a hypothesis, a thermometer, a conductivity check, and a graph review.

Key terms

polymer

A long molecule built by linking many repeating units, such as polyethylene built from ethene units of formula C_2H_4. (repeating chain)

solvent

A substance, often a liquid, that dissolves another substance. Ethanol and propanone are molecular examples. (C_2H_6O)

nanotechnology

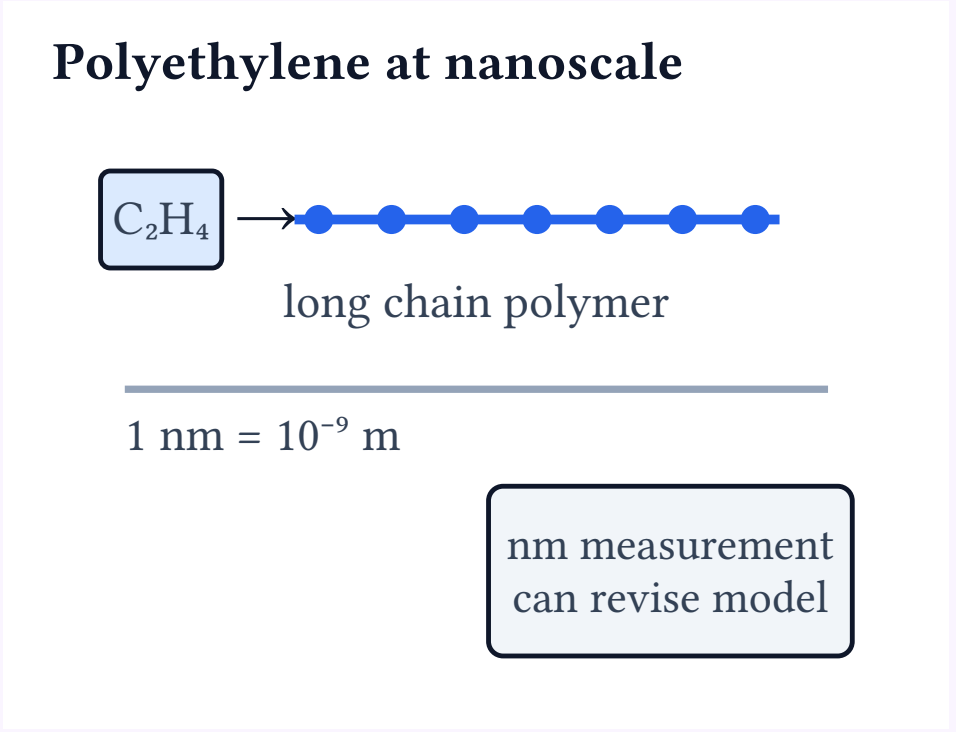
Work at the scale of a nanometre, one billionth of a metre, where new measurements can revise a model of how atoms are arranged. (10^{-9} m)

hypothesis

A stated expectation that names the pattern you will compare with measurements. (prediction before data)

Molecular materials at the nanoscale

- Polyethylene is a long chain made by linking ethene units, each C_2H_4.
- A nanometre is 10^{-9} m, and a measurement at that scale can revise a model.



A melting plan with the label first

- The hypothesis says stearic acid melts higher than lauric acid because the longer chain has stronger London forces.
- The label is read, and goggles go on, before the water bath is started.

Boiling point plot

- The horizontal axis is the carbon count: 1, 2, and 3.
- The vertical axis is boiling point: −161.5 °C, −88.6 °C, and −42.1 °C.

Someone else's graph

- Another group's graph is judged against the same three temperatures.
- Different readers can notice different faults, and the comparison improves the trend model.

Image credits

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