Properties of carbon compounds (Level 1) exam tips

Trends in melting and boiling points AND solubility in water

• The bond between atoms (intramolecular) is a strong covalent bond

• The force between molecules (intermolecular) is very weak

Melting and boiling points

• Melting point is the temperature at which all of the substance has changed from a solid to a liquid state

• Boiling point is the temperature at which all of the substance has changed from a liquid to a gas state

*trend*: As the length of the carbon chain **increases** the melting and boiling points **also increase**.

*explanation:* The longer the carbon chain… (be specific, write down the exact number of carbon atoms and the name(s) of the molecule(s) you are discussing)

the larger the molecule and heavier the mass (as there are more protons in the nucleus and also

more electrons orbiting the nucleus)

so there is an increase in the strength of the weak intermolecular forces between molecules,

because there is a stronger force of attraction between molecules,

therefore more heat energy is required to overcome/break those forces and separate the molecules,

so the melting/boiling point of the hydrocarbon is higher

Solubility

• Hydrocarbons (alkanes and alkenes) are not soluble in water because there are no attractive forces between hydrocarbon and water molecules• Alcohols (up to butanol) are soluble in water because both alcohols and water contain hydroxy (-OH)

groups, so alcohols and water are attracted to each other

• Immiscible solutions don't mix eg *oil and water*

Also…”don’t be daft”  
Melting point is NOT THE SAME as boiling point

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