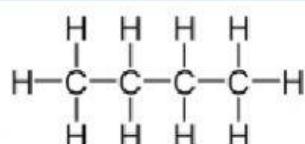


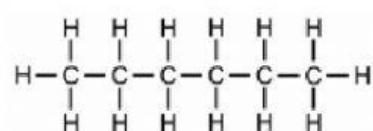
Tutorial Physical properties

Boiling point (BP)

Different Mr/
Molecular weight



Low Mr, Low BP

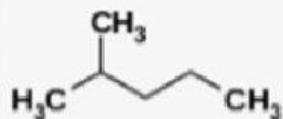


High Mr, High BP

Same Mr/Molecular mass but
Branched vs unbranched

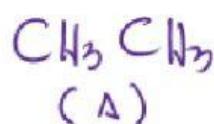


Unbranched Alkane, High BP



Branched alkane, Low BP

Boiling point

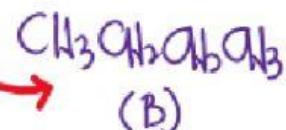


a) Different Mr

• Higher Mr/Molecular weight

• Bigger size of molecule
• Bigger contact surface area

• Stronger IMF/Van der Waal forces
• More energy needed to break the forces



Boiling point B > A

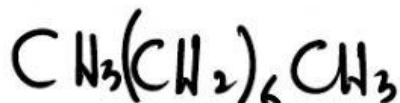
Note: Mr = Relative molecular weight

All alkanes has London Dispersion forces as its IMF

Physical Properties

1. Arrange the following molecules ascending order of boiling point. Explain your answer.

a) octane and heptane



Octane



vs



Heptane



Octane has _____ Mr than heptane.

Octane has _____ molecule than heptane.

Octane has _____ contact surface area than heptane.

_____ has stronger Intermolecular forces than _____.

_____ energy is needed to break the forces in _____.

Higher boiling point for _____.

b) Butane and Hexane



C_4H_{10}
Butane

vs



C_6H_{14}
Hexane

Hexane has _____ Mr than butane.

Hexane has _____ molecule than butane.

Hexane has _____ contact surface area than butane.

_____ has stronger Intermolecular forces than _____.

_____ energy is needed to break the forces in _____.

Higher boiling point for _____.

c) Cyclopropane vs Cyclopentane



vs



Cyclopentane has _____ Mr than cyclopropane.

Cyclopentane has _____ molecule than cyclopropane.

Cyclopentane has _____ contact surface area than cyclopropane.

_____ has stronger Intermolecular forces than _____.

_____ energy is needed to break the forces in _____.

Higher boiling point for _____.

d)



vs



Pentane has _____ Mr than heptane.

Pentane has _____ molecule than heptane.

Pentane has _____ contact surface area than heptane.

_____ has stronger Intermolecular forces than _____.

_____ energy is needed to break the forces in _____.

Higher boiling point for _____.