

Question 17 (3 marks)

Explain why alkanes and their corresponding alkenes have similar physical properties, but very different chemical properties.

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Alkanes have similar physical properties ~~as~~ ^{because} they ~~are~~ ^{both} have CH_2 groups of atoms between successive groups. However, they have different chemical properties due to the difference in bonding between atoms. Alkanes have single bonds and hence combine with other atoms (e.g. bromine) by ~~addition~~ ^{substitution} reactions, where one atom or group is replaced by another. However, alkenes are unsaturated hydrocarbons, containing ~~one~~ ^{one} double bonds ~~between~~ ($C=C$). Hence they combine ~~to~~ with other atoms and molecules by addition reactions, where the double bond is broken, forming single bonds. Hence, the alkanes and their corresponding alkenes have similar physical properties but very different chemical properties.