1. **Crude Oil, Hydrocarbons and Alkanes**

1. What is the formula of an alkane with eight hydrogens? Draw its structural formula (2)

2. Describe what crude oil is, how it is made and what it is made of. (6)

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3. Give the name and formulae for the first two alkanes in the homologous series. (2)

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1. **Fractional Distillation And Petrochemicals**

1. Name three of the fractions separated in fractional distillation (3)

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2. Explain how fractional distillation separates these fractions. (4)

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3. Why are there so many natural and synthetic carbon compounds? (1)

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4. Name two materials produced by the petrochemical industry. (2)

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1. **Properties of Hydrocarbons**

1. Hydrocarbons in crude oil vary in their size. Describe how increasing molecular size of hydrocarbons alters the boiling point, viscosity and flammability of hydrocarbons. (3)

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2. Describe what happens to the carbon and hydrogen atoms in a hydrocarbon during combustion. (3)

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3. Write the balanced symbol equation for the complete combustion of pentane gas C5H12 (3)

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1. **Cracking and Alkenes**

 1. Name two types of cracking and explain why scientists might want to crack hydrocarbons. (4)

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2. The cracking of hydrocarbons can make alkanes and one other type of chemical. Name this chemical and describe a chemical test that could be used to identify between this chemical and the alkane. Give the positive test result as part of your answer. (3)

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3. A scientist carried out an experiment to crack a hydrocarbon, here is the symbol equation for the reaction. The chemical that was cracked was C12H26 . One of the products was C2H4., hat is the formula of the other product? (2)

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1. **Structure, Formula And Reactions of Alkenes (Chemistry only)**

1. Alkenes are hydrocarbons with a double carbon – carbon bond. Give the general formula of the

alkenes and explain why they are called unsaturated. (2)

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2. Butene is an alkene that contains four carbon atoms. Write out its formula and draw its structural formula. (2)

3. In a reaction, propene was reacted with water. Write a balanced symbol equation for the reaction, then name and draw the structural formula of the product made. (3)

1. **Alcohols (Chemistry only)**

1. Ethanol C2H5OH is made during fermentation. Draw the structural formula of ethanol, describe the conditions needed for fermentation and explain why one of the conditions is the absence of oxygen. (6)

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1. **Carboxylic acids (Chemistry only)**

1. Draw the structure of propanoic acid and indicate the functional group. (3)

2. Describe what you would see if calcium carbonate was added to propanoic acid and compare this to the reaction of calcium carbonate with nitric acid. Explain the difference in the reactions. (6)

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1. **Addition polymerisation (Chemistry only)**

1. Explain what happens during addition polymerisation. (3)

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2. Below is the monomer vinyl chloride. Draw the structural formula for the addition polymer it will make and show the repeating unit. (4)



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1. **Condensation polymerisation and Amino Acids (Chemistry only HT only)**

1. Explain what happens during condensation polymerization. (3)

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2. Propane diol polymerises with butanedioc acid to produce a polyester. Explain using a symbol equation how these monomers produce a condensation polymer (polyester). (3)

Propane diol HO – CH2 – CH2 – CH2 – OH

Butanedioc acid HOOC – CH2 - CH2 –COOH

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 3. How are polypeptide chains formed? (2)

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1. **DNA and other naturally occurring polymers**

 1. Describe fully the structure of DNA. (4)

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