

Solutions

2.1 C_4H_{10} .

2.2 Any two of: boiling point rises; viscosity increases; flammability decreases.

2.3 An alkene – unsaturated.

3.1 The oil is heated and vapourised; the column is cooler towards the top; vapours condense at the level where the temperature equals their boiling point; molecules with similar boiling points – similar sizes – collect as the same fraction.

3.2 C_2H_4 ; $\text{C}_6\text{H}_{14} \rightarrow \text{C}_4\text{H}_{10} + \text{C}_2\text{H}_4$ is balanced – 6 C and 14 H each side; ethene.

3.3 Catalytic cracking – vaporised hydrocarbon passed over a hot catalyst; steam cracking – vaporised hydrocarbon mixed with steam at very high temperature. Cracking provides smaller alkanes for fuels, in higher demand than the large fractions supplied by distillation; and alkenes for polymers and other chemicals.