ANSWERS: Additional questions on **identifying organic substances**

**1.** Carry out the following tests

1st: add red litmus paper to each test tube of colourless solutions

Observation: the 1-aminohexane will turn red litmus paper a blue colour

2nd: add blue litmus paper to the remaining three test tubes of colourless solutions

Observation: the hexanoic acid will turn blue litmus a red colour

3rd: add a few mL’s of water to the remaining two test tubes

Observation: the cyclohexane is immisible with water so will float on top of the water and been seen as a separate layer

4th: the remaining test tube contains hexan-2-ol

**2.** Add a few mL’s of Na2CO3(aq) to each of the solutions.

Heptan-1-ol is a long chain alcohol and does not dissolve in the aqueous Na2CO3

C7H15OH(l) + Na2CO3(aq) 🡪 C7H15OH(l) + Na2CO3(aq)

butanoic acid will react with Na2CO3 to produce carbon dioxide gas so bubbling will be observed

C3H7COOH(l) + Na2CO3(aq) 🡪 C3H7COONa(l) + CO2(g) + H2O (l)

aminoethane is a short chain amine and will dissolve in the aqueous Na2CO3

C2H5NH2(l) + Na2CO3(aq) + H3O+ (l)+ OH- (l) 🡪 C2H5NH3+ (l) + H2O(l) + OH- + Na+(aq) + CO32- (aq)

**3.** **Firstly**, react of each of the substances with **potassium permanganate KMnO4**

Propanoic acid

There is no colour change because the propanoic acid cannot be oxidised further

Ethanol

The colour change is from purple to colourless because the ethanol (a primary alcohol) is oxidised to Ethanoic acid

The equation for the reaction is:

[O]

CH3CH2OH 🡪 CH3COOH

But-2-ene

The colour change is from purple to colourless because the but-2-ene is oxidised to butan-2,3-diol

The equation for the reaction is

[O]

C4H8 🡪 CH3CH(OH)CH(OH)CH3

**Secondly,** the reaction of each of the substances with **potassium dichromate K2Cr2O7**

Propanoic acid

There is no colour change because the propanoic acid cannot be oxidised further

Ethanol

The colour change is from orange to green because the ethanol (a primary alcohol) is oxidised to ethanoic acid

The equation for the reaction is:

[O]

CH3CH2OH 🡪 CH3COOH

But-2-ene

The colour change is from orange to green because the but-2-ene is oxidised to butan-2,3-diol

The equation for the reaction is

[O]

C4H8 🡪 CH3CH(OH)CH(OH)CH3

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