

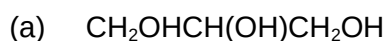
Name of the Student: _____

Max. Marks : 23 Marks

Time : 23 Minutes

Mark Schemes

Q1.



1

(Potassium) Carboxylate salt

*Allow fatty acid salt / salt**Salt of a carboxylic acid*

1

Soap

Allow detergent / surfactant

1

(b) $638 = 173 + 3(15 + 14n)$

 M_r ester fragment = 173

M1

Show subtract $638 - (M1 + 45)$

M2

Division of M2 by 42

 $n = 10$ *n must be an integer*

M3

(c) Amount HCl = $0.100 \times 0.01565 = 1.565 \times 10^{-3} \text{ mol}$

M1

Initial amount KOH = $\frac{0.421}{56.1} = 7.50 \times 10^{-3} \text{ mol}$

M2

Amount KOH used = $M2 - M1 = 5.939 \times 10^{-3} \text{ mol}$

M3

Amount ester = $\frac{5.935 \times 10^{-3}}{3} = 1.980 \times 10^{-3} \text{ mol}$ (M3 / 3)

M4

Mass ester = $(1.980 \times 10^{-3}) \times 638 = 1.263 \text{ g}$ (M4 x 638)

M5

%age by mass = $\frac{1.263}{1.45} \times 100 = 87.1 \%$ ((M5 / 1.45) x 100)

*Allow 87.0 to 87.1**Allow 2 sf**Don't allow M6 for an answer >100%*

- (d) Allow to dissolve both oil and KOH

*To act as a mutual solvent **OR** To ensure reactants are miscible*

M1

Precaution must be linked to heating

e.g. Use a water bath for heating mixture

Allow electrical heater / mantle

Allow sand bath

M2

Prevents risk of fire / Ethanol is flammable

Allow KOH is corrosive/caustic/damages eyes if matches alternative precaution given

M3

[15]

Q2.

- (a) **M1** $n(\text{S}_2\text{O}_3^{2-}) = 33.50 \times 0.100 \div 1000 = \underline{0.00335}$ 1
- M2** $n(\text{I}_2) = 0.00335 \div 2 = 0.001675$ (from eqn 2)
M2 = **M1** ÷ 2 1
- M3** $n(\text{ClO}^-)$ in 25 cm³ pipette = 0.001675 (from eqn 1)
M3 = **M2** 1
- M4** $n(\text{ClO}^-)$ in 100 cm³ flask = 0.001675 x 4 = 0.00670 = $n(\text{NaClO})$ in original 10 cm³ sample
M4 = **M3** x 4 1
- M5** mass (NaClO) = 0.00670 x 74.5 = 0.499 g
M5 = **M4** x 74.5 1
- M6** mass (bleach) = 10.0 x 1.20 = 12 g
M6 = mass of bleach 1
- M7** % by mass of NaClO = $\frac{0.499}{12} = 4.16\%$
M7 = (**M5** ÷ **M6**) x 100 to 3 significant figures
 Allow 4.15% to 4.17% 1
- (b) 0.45% 1

[8]