Practice Question Set For A-Level
Subject : Chemistry
Paper-2 Topic: Physical

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Name of the Student:_____
Max. Marks : 20 Marks **Time : 20 Minutes**

Mark Schemes

Q1.

(a) Electrophilic substitution both words needed

Allow minor spelling errors e.g. electrophillic or subsitution

Ignore nitration

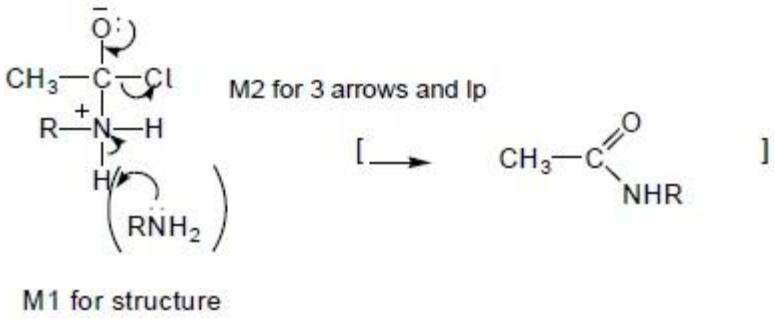
1

(b) + $3H_2$ ..... + $2H_2O$

Allow 6 [H]

1

(c)



M1 *for structure of ion including 2 charges (+ on N must be correct in both cases if drawn twice)*

M2 *for 3 arrows and lp on O - may be scored in two steps*

Ignore use of RNH_2 to remove H^+ in ***M2****, but penalise use of Cl^-*

2

(d) Corrosive **OR** forms strong acid/HCl (fumes) **OR** vulnerable to hydrolysis **OR** dangerous (to use)

Allow anhydride is less corrosive ***OR*** *does not form strong acid fumes* ***OR*** *less vulnerable to hydrolysis*

OR *ethanoyl chloride is more expensive*

Allow reacts violently / extremely exothermic / extremely vigorous

Ignore toxic / harmful / hazardous

1

(e)

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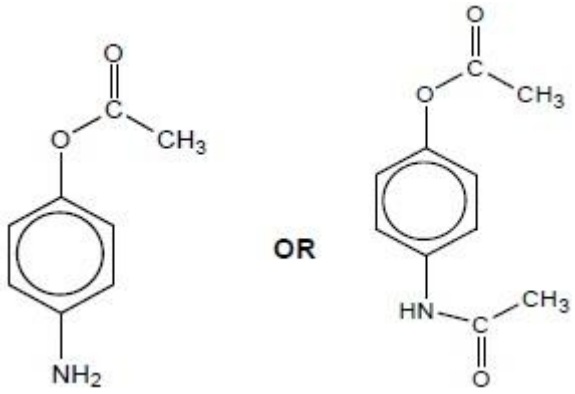

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(f) + CH_3COONH_4 ..... + $2H_2O$

Allow CH_3COO^- / $CH_3CO_2^-$ and NH_4^+

Allow NH_4CH_3COO

1

(g) *Via moles*

M1 M_r paracetamol = 151(.0)

M1

M2 Amount paracetamol = 250 × 10^3 / 151.0 = 1655.6 mol
OR (250 × 10^3) / **M1**

(= amount hydroquinone used)

M2

M3 Mass hydroquinone = 1655.6 × 110.0 = 182119 g = 182 kg
OR correct answer to **M2** × 110.0 / 1000

M3

OR via mass
M1 *M_r paracetamol = 151(.0)*
So 110 g hydroquinone forms 151 g paracetamol
M2 *Mass hydroquinone needed 250 × 110 / 151.0*
OR *250 × 110 /* ***M1***
= 182 kg

Min 2sf
If Mr values used wrong way round can score ***M2***

[10]

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Q2.

(a) $(COOH)_2 = C_2H_2O_4 = 90$

M1

118 - 90 = 28 OR C_2H_4

M2

$C_4H_6O_4$

M3

Must be molecular formula
*Structural formula can score **M1** & **M2***

(b) Amount NaOH = $(21.60 \times 10^{-3}) \times 0.109$

$= 2.3544 \times 10^{-3}$ mol
***M1** for answer (to 3sfs min)*

M1

Amount H_2A in 25 $cm^{-3} = 1.177 \times 10^{-3}$ mol
M2** = 0.5 × **M1

M2

Amount H_2A in 250 $cm^{-3} = 1.177 \times 10^{-2}$ mol
***M3** = **M2** × 10*

M3

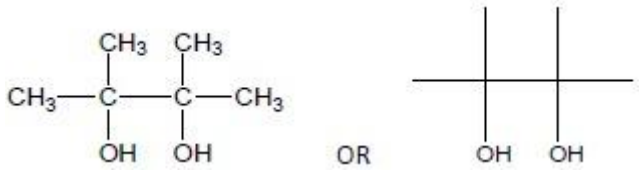
Mass = 1.39 g (Must be 3sf)
***M4** = answer to (**M3** × 118) and must be 3sf*

M4

(c) 4 or four

1

(d)



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(e) The precise (relative molecular) masses are <u>different</u> or wtte
Allow M_r are different to 2 or more or several dp
Ignore different molecular formula
Ignore accuracy
Penalise fragments

1

[10]

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