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

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Exam Preparation and Free Resources

Name of the Student:_____
Max. Marks : 22 Marks **Time : 22 Minutes**

Mark Schemes

Q1.

(a) Electrophilic substitution both words needed

Allow minor spelling errors e.g. electrophillic or subsitution

Ignore nitration

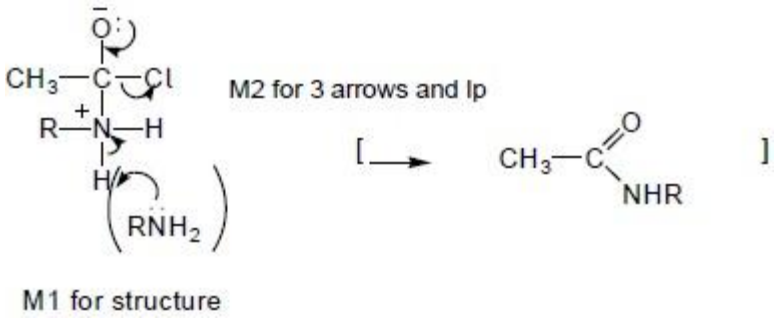
1

(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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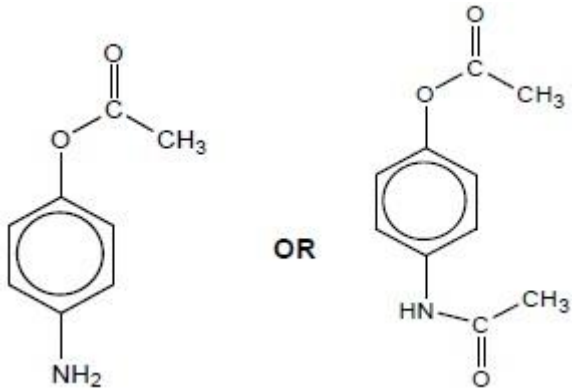

1

(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.

C

[1]

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Q3.

D

[1]

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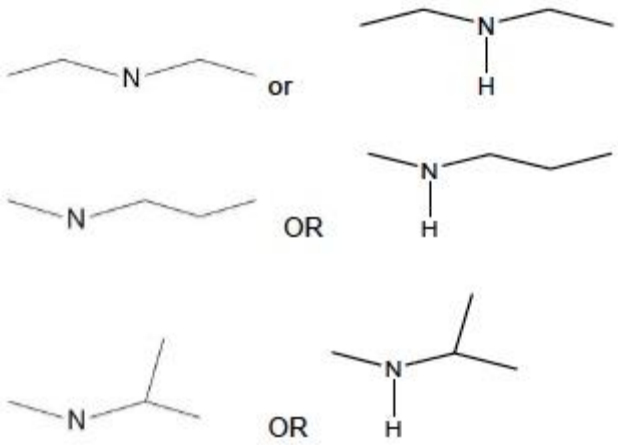
Q4.

(a) C B A this order only

1

(b) Any three from

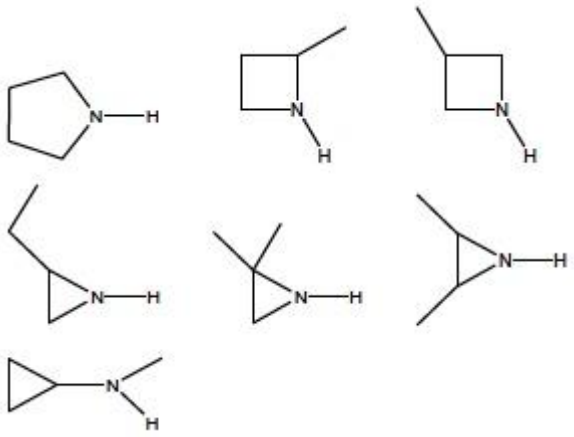


Must be skeletal *– allow with or without H on N*

All 3 correct score 2 (or one if not skeletal)

Any two correct score 1 (or zero if not skeletal)

Allow cyclic II^{o} amines but NOT amines also containing other functional groups



2

(c) With halogenoalkane:

further reaction (of primary amines)

OR

Impure product/mixture of products/lower atom economy

Ignore bi-product / yield

1

With nitriles

No further reaction

OR

Single product / higher atom economy

1

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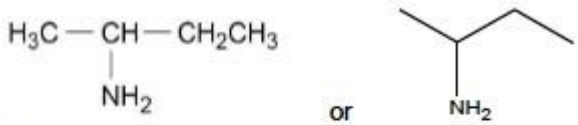
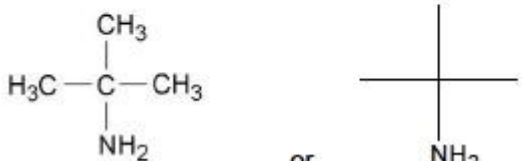
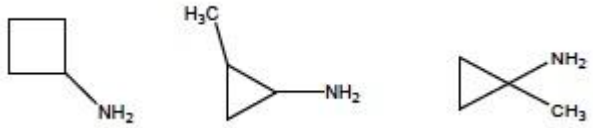


or



(d)

Allow cyclic I^o amines but NOT amines also containing other functional groups



1

(e) $CH_3CH_2CH_2NH_2 + H_2O \rightleftharpoons CH_3CH_2CH_2NH_3^+ + OH^-$

Allow simple arrow

Not C_3H_7

1

(green) turns blue

Allow blue-green, blue-purple

1

(f) $C_6H_5NO_2 + 6[H] \rightarrow C_6H_5NH_2 + 2H_2O$

Not H2

Not molecular formulae

OR

1

$C_6H_5NH_2$ present as ionic salt OR $C_6H_5NH_3^+$ (Cl^-) OR phenyl ammonium (chloride)

Allow present as an ion

But not phenylammonium hydroxide

1

[10]

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