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

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Exam Preparation and Free Resources

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

Mark Schemes

Q1.

(a) **M1** + 3 C_2H_6

M2 Zeolite/Aluminosilicate/Aluminium oxide

2

(b) Option B

1

(c) Alkenes

1

(d) **M1** Initial volume O_2 = 0.21 × 1350 = 283.5 (cm^3)

Alternative route:
M1 Vol Air decreases by 6.5 × 20 = 130 cm^3

M2 Volume of O_2 remaining = M1 - (6.5 × 20) = 153.5 cm^3

M2 = 1220 cm^3

M3 Volume of CO_2 formed = 20 × 4 = 80 cm^3

M3 Vol CO_2 produced = 4 × 20 = 80 cm^3

M4 Total volume of gas left = M2 + M3 + (0.79 × 1350) = 1300 cm^3

M4 Total Vol Air + CO_2 = 1220 + 80 = 1300 cm^3

4

(e) **M1** Acid rain

M1 Allow damages (limestone) buildings or statues/death of aquatic organisms/air pollution

M2 CaO or $CaCO_3$

2

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Q2.

(a) **M1** Benzene is more stable than cyclohexatriene

M2 The enthalpy of hydrogenation of benzene is (152 kJ mol^{-1}) less/less exothermic

M3 Due to the delocalisation of electrons in benzene

M4 Both are planar/hexagonal

M5 Benzene has equal C-C bond lengths or regular hexagon whereas Cyclohexa-1,3,5-triene has bonds of different/varied length or the hexagon is distorted/irregular

M4 and M5 could be shown in a clear diagram

5

(b) **M1** Concentrated nitric acid AND concentrated sulfuric acid/conc. HNO_3 AND conc. H_2SO_4

M2

$HNO_3 + 2\ H_2SO_4 \rightarrow NO_2^+ + H_3O^+ + 2\ HSO_4^-$

OR

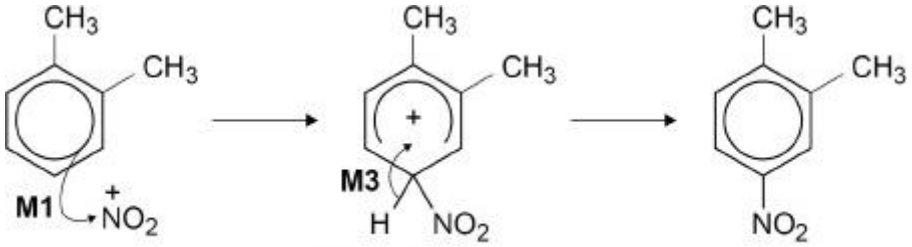
$HNO_3 + H_2SO_4 \rightarrow H_2NO_3^+ + HSO_4^-$ then $H_2NO_3^+ \rightarrow NO_2^+ + H_2O$

OR

$HNO_3 + H_2SO_4 \rightarrow H_2O + NO_2^+ + HSO_4^-$

2

(c)



M2 – structure

M1 Positive must be on N and arrow from inside hexagon to N or + on N

M2 Structure showing horseshoe and positive charge.

- *Horseshoe centred on C1 but must not extend beyond C2 and C6*
- *+ in intermediate not too close to C1 (allow on or ";above" a line from C2 to C6)*

M3 Arrow from C-H bond back into hexagon

3

(d) Sn/HCl

Allow H_2 with Pt/Ni
Allow HCl with Fe

Ignore references to NaOH used after Sn/HCl BUT penalise if NaOH used at the same time as Sn/HCl

1

(e) Manufacture of dyes/(cationic) surfactants/fabric softener

Allow to make hair/fabric conditioner

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1

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