

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

Name of the Student: _____

Max. Marks : 18 Marks

Time : 18 Minutes

Mark Schemes

Q1.

- (a) Electrophilic substitution

Both words needed

Ignore minor misspellings

1

- (b) (i) Sn / HCl

OR H₂ / Ni **OR** H₂ / Pt **OR** Fe / HCl **OR** Zn / HCl **OR** SnCl₂ / HCl

Ignore conc or dil with HCl,

Allow (dil) H₂SO₄ but not conc H₂SO₄

Not allow HNO₃ or H⁺

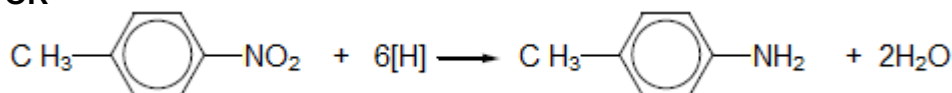
Ignore NaOH after Sn / HCl

Ignore catalyst

1

- (ii) $\text{CH}_3\text{C}_6\text{H}_4\text{NO}_2 + 6[\text{H}] \rightarrow \text{CH}_3\text{C}_6\text{H}_4\text{NH}_2 + 2\text{H}_2\text{O}$

OR



Allow molecular formulae as structures given

$\text{C}_7\text{H}_7\text{NO}_2 + 6[\text{H}] \rightarrow \text{C}_7\text{H}_9\text{N} + 2\text{H}_2\text{O}$

Qu states use [H], so penalised 3H₂

1

- (iii) making dyes

OR making quaternary ammonium salts

OR making (cationic) surfactants

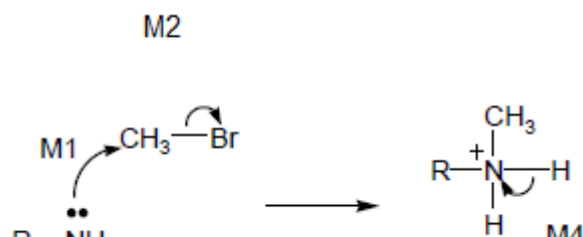
OR making hair conditioner

OR making fabric softener

OR making detergents

1

- (c)



M3

NO Mark for name of mechanism

Allow SN1

M1 for lone pair on N and arrow to C or mid point of space between N and C

M2 for arrow from bond to Br

M3 for structure of protonated secondary amine

M4 for arrow from bond to N or + on N

For M4: ignore RNH₂ or NH₃ removing H⁺ but penalise Br⁻

4

(d) lone or electron pair on N

If no mention of lone pair CE = 0

If lone pair mentioned but not on N then lose M1 and mark on

M1
1

in **J** spread / delocalised into ring (or not delocalised in **K**)

Ignore negative inductive effect of benzene

Allow interacts with π cloud for M2

M2
1

less available (for protonation or donation in **J**)

M3

OR

in **K** there is a positive inductive effect / electron releasing)

M2

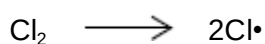
more available (for protonation or donation in **K**)

M3
1

[11]

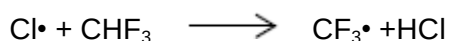
Q2.

(a) (i) **M1 Initiation**



Penalise absence of dot once only.

M2 First propagation



Penalise + or - charges every time.

M3 Second propagation



Credit $\text{CF}_3\cdot$ with the radical dot above / below / to either side.

M4 Termination (must make C_2F_6)



Mark independently.

4

(ii) ultra-violet / uv / sun light

OR (very) high temperature

OR $500^\circ\text{C} \leq T \leq 1000^\circ\text{C}$

OR $773\text{ K} \leq T \leq 1273\text{ K}$

1

(b) (i) $\text{Cl}\cdot$ **OR** chlorine atom / chlorine (free-) radical / Cl (atom)

Not 'chlorine' alone.

Credit 'Cl' alone on this occasion.

1

(ii) $2\text{O}_3 \longrightarrow 3\text{O}_2$

Or multiples.

Ignore state symbols.

If the correct answer is on the line OR clearly identified below some working, then ignore any working.

1

[7]