31. Halogen compounds

31.1 Halogen compounds

Paper 4

Marking Scheme

Q1.

(a)	• chlorobenzene is **less reactive** than chloroethane **OWTTE** • p-orbital / lone pair **on C*l*** will overlap / delocalise into the ring • due to partial double C-C*l* bond **OWTTE** **OR** C-C*l* bond strengthened (more) Any two [1], all three [2]	**2**

Q2.

(c)(i)	(aqueous / alkaline) $AgNO_3$ / silver nitrate	**1**
(c)(ii)	$C_2H_5Cl + H_2O \rightarrow C_2H_5OH + HCl$ / $C_2H_5Cl + NaOH \rightarrow C_2H_5OH + NaCl$ **AND** $Ag^+ + Cl^- \rightarrow AgCl$ **AND NO** equation shown for C_6H_5Cl	**1**
(c)(iii)	lone pair / p-orbital from **C*l*** overlaps with benzene ring **AND** stronger / partial double C-C*l* bond **OR** difficult to break C-C*l* bond	**1**

Q3.

(a)	**M1**: $CH_3COCl > CH_3CH_2Cl > C_6H_5Cl$ **M2 & M3 any two from:** • in C_6H_5Cl (no hydrolysis) C-C*l* bond is part of delocalised system **OR** p-orbital on C*l* overlaps with π system **OR** electrons from C*l* overlap with π system • CH_3COCl carbon in C-C*l* bond is more electron deficient since it is also attached to an oxygen atom (ora) **or** C-C*l* bond strength is weakest in CH_3COCl (ora) • CH_3CH_2Cl carbon in C-C*l* bond strengthened by positive inductive effect of alkyl group	**3**