Intermolecular Forces - Mark Scheme

Q1.

Question number	Answer	Mark
	D pentane	1

Q2.

Question number	Answer	Mark
	A all Group 1 hydroxides are soluble in water	1

Q3.

Question number	Answer	Additional guidance	Mark
(a)	• balanced equation (1) • all states correct (1)	$I_2(s) + Cl_2(g) \rightarrow 2ICl(l)$ Accept multiples	2

Question number	Answer	Additional guidance	Mark
(b)	• correct electronegativity values and correct dipole diagram	Cl = 3.0 **and** I = 2.5 δ+ I — Cl δ- Do not award full charges	1

Question number	Answer	Additional guidance	Mark
(c)(i)	• 1 mark each correct formula	 Allow 1 mark for 2 correct non-skeletal formulae	2

Question number	Answer	Additional guidance	Mark
(c)(ii)	An explantion that makes reference to the following points: • identification of correct isomer (1) • iodine is δ+ and is attacked by the π electrons (1) • more stable secondary carbocation formed. (1)	2-chloro-1-iodopropane	3

Question number	Answer	Additional guidance	Mark
(d)(i)	An answer that makes reference to the following points: • carry out in fume cupboard (1) • chlorine is toxic. (1)	 Allow fume hood or similar description Do not allow 'harmful'	2

Question number	Answer	Additional guidance	Mark
(d)(ii)	• I in ICl = +1 I in ICl_3 = +3	Both needed for the mark	1

Question number	Answer	Additional guidance	Mark
(d)(iii)	• +5 **and** -1 to -1 (and -1) (1) • not disproportionation because the chlorine has not undergone both oxidation and reduction (1)		2

Question number	Answer	Additional guidance	Mark
(e)(i)	• correct method (1) • answer with units (1)	$Cl_2 = 2 \times 35.5 = 71$ $71 \div 24000$ $= 0.0029583$ g cm^{-3} $= 3$ g dm^{-3}	2

Question number	Answer	Additional guidance	Mark
(e)(ii)	An explanation that makes reference to the following points: • chlorine (gas) is more dense than air (1) • chlorine (gas) removed (from the equilibrium) (1) • position of equilibrium moves to the LHS (more brown liquid/ICl). (1)		3

Question number	Answer	Additional guidance	Mark
(f)	• calculation of mols of iodine and fluorine (1) • calculation of whole number ratio and formula (1)	Mols of iodine = $0.64 \div 126.9 = 5.04 \times 10^{-3}$ Mols of fluorine = $(1.31-0.64) \div 19 = 3.53 \times 10^{-2}$ Ratio 1:7 therefore formula IF_7	2

Q4.

Question number	Answer	Mark
	B Y X Z W	1