Sec 3E Chemistry 6092 / Year 2023 / Term 2 WA2 Mark Scheme

SECTION A [5 marks] Question 1 2 3 4 5 Answer С В А D А SECTION B [10 marks] 6 (1), 12, 8(a) 1 1 **(b)** (1), 5, 3, 4 1 (c) 2, 3, 6, (1) [total 3 marks] 7 Metallic structure, [1] 2 (a) lattice of positive ions [1/2] in a sea of delocalized electrons. [1/2] (b) (i) $Sc_2(SO_4)_3$ 1 (i) Sc(OH)₃ 1 [total 4 marks] Any one of the following: 8 (a) 1 High melting point Insoluble in water (but soluble in organic solvent) • Conducts electricity Brittle / slippery • 1 (b) compare – both buckyball and graphite have 1 carbon atom covalently bonded to 3 other carbon atoms, with 1 (unbonded) electron, delocalized, free-moving / mobile, able to conduct electricity. prediction buckyball can conduct electricity 1 [total 3 marks] SECTION C [20 marks] 9 element to chlorine ratio increases from 1:1 (in NaCl) to 1:4 (in SiCl₄), 1 (a) 1 then **decreases** to 1:1 (in S_2Cl_2 and Cl_2). Data from table 9.1 agrees with student 2, disagrees with student 1. (b) 1 chlorides that hydrolyse all contain covalent bonding / 1 chlorides that dissolves all contain ionic bonding Use of aluminium chloride to illustrate: 1 although aluminium is a metal, aluminium chloride ($AlCl_3$) is a covalent chloride, and aluminium chloride hydrolyses (as per covalent chlorides) but not dissolves. 9 Argon has stable electronic configuration (full valence shell) and does not 1 (c) react and form chloride.



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