

## Half Yearly Examinations 2016

### Form 3 – Chemistry

#### Marking Scheme

Question Number	Answers	Marks	Additional Guidance
<b>Section A</b>			
1a 1b(i) (ii)	Solution, solvent, solute Melting point Boiling point	1 mark each 1 mark 1 mark	
2a b c d e	17°C 115°C The temperature increases Liquid The boiling point is above 100°C.	1 mark each	
3	a)chemical b) physical c)chemical d) physical	1 mark each	
4	a)D b)E c)C d)B e)A	1 mark each	
5a b c	Diffusion On diagram ammonia	1 mark each	
6 (i)  (ii)  (iii)	a) KCl b) Ca(OH) <sub>2</sub> c) Na <sub>2</sub> SO <sub>4</sub> d) MgCO <sub>3</sub> , e) Zn(NO <sub>3</sub> ) <sub>2</sub>  a) sodium hydroxide, b) copper nitrate, c) iron(II) sulphate, d) water, e) magnesium chloride  $\text{H}_2\text{SO}_4(\text{aq}) + 2\text{NaOH}(\text{aq}) \rightarrow \text{Na}_2\text{SO}_4(\text{aq}) + 2\text{H}_2\text{O}(\text{l})$  $2\text{HCl}(\text{aq}) + \text{K}_2\text{CO}_3(\text{aq}) \rightarrow 2\text{KCl}(\text{aq}) + \text{CO}_2(\text{g}) + \text{H}_2\text{O}(\text{l})$	0.5 mark each       2 marks each	
7a)	Carbon: P-6, E-6, N-6, Elect conf – 2,4 Chlorine: P-17, E-17, N-18 Elect conf – 2,8,7 Potassium: P-19, E-19, N-20 Elect conf – 2,8,8,1 Oxide: P-8, E-10, N-8, Elect conf- 2,8	1 mark each	

8a b c	Diagram of potassium atom KCl diagram	5 marks 1 mark 6 marks – 3 marks for the potassium ion and 3 marks for the chloride ion	
9a) b)	Isotopes $^{35}_{17}\text{Cl}$	2 marks 2 marks	
<b>Section B</b>			
10A a)  b) c) d)  B a) b) c) d) e)	magnesium – 2,8,2, Oxygen – 2,6 Diagram Magnesium oxide Any two properties  Carbon dioxide, $\text{CO}_2$ 2 pairs of electrons Diagram Any other covalent compound Any two properties	1 mark 1 mark 5 marks 1 mark 2 marks  2 marks 1 mark 4 marks 1 mark 2 marks	
11A a) b)  c) d) e)  f) g) h)  i) j)	distillation A – thermometer, B – water out, C – Liebig condenser, D – water in, E – tripod, F - Bunsen burner D This reduces frothing in the round bottomed flask. The bulb of the thermometer should be placed as shown since it is used to measure the temperature of the vapour.  ethanol  At $100^\circ\text{C}$ The physical properties can be measured, such as density, M.P. and B.P. A fractionating column Liquids with very close B.P.	1 mark 1 mark each  1 mark 2 marks 2 marks  1 mark 1 mark 2 marks  2 marks 2 marks	
12i)  ii) iii)	Sublimation is the process of a solid which becomes a gas Ammonium chloride Iodine is a substance that sublimates. A purple vapour forms during heating which condenses on the sides of the inverted funnel to form black/purple crystals of iodine.	1 mark  1 mark 1 mark 2 marks for observation 3 marks for diagram	

iv)	<p>Solution– The remaining mixture is placed in a beaker. Water is added and stirred using a stirrer. The solution can be heated to make sure that all the sodium chloride has dissolved.</p> <p>Filtration– Separation of sand The solution is filtered. Sand is collected as the residue, while the salt solution is the filtrate.</p> <p>Evaporation to dryness - The solution is placed in an evaporating basin and heated over a steam bath. Heating is continued until all water has evaporated from solution.</p>	<p>2 marks for procedure 2 marks for diagram</p> <p>2 marks for procedure 2 marks for diagram</p> <p>2 marks for procedure 2 marks for diagram</p>	
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