

Name : _____ () Class : 3E1



GreenRidge Secondary School

End-of-Year Re-Examination 2001

Subject : Chemistry (5068)
Secondary Three Express

Date : 15 Nov 2001

Duration : 45 mins

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INSTRUCTIONS TO CANDIDATES

Write your name, index number and class in the spaces at the top of this page and on all separate answer paper used.

HAND UP YOUR ANSWERS TO EACH SECTION SEPARATELY.
DO NOT STAPLE THEM TOGETHER.

Answer **all** questions. Write your answers in the spaces provided on the question paper.

INFORMATION FOR CANDIDATES

The number of marks is given in brackets [] at the end of each question or part question.
A copy of the Periodic Table is printed on page 6.

This paper consists 6 printed pages, including this page.

Answer **ALL** questions in the spaces provided.

Question 1 [5 mks]

<i>Caesium</i>	<i>Oxygen</i>	<i>Copper</i>	<i>Calcium</i>
<i>Chlorine</i>	<i>Argon</i>	<i>Aluminium</i>	<i>Nitrogen</i>
<i>Hydrogen</i>	<i>Lead</i>	<i>Sodium</i>	<i>Helium</i>

Use the above list to answer the questions below. Each element can be used once, more than once, or not at all.

- (a) Two elements that form two different positive ions each [1]

- (b) Two elements which react with oxygen to forms a neutral oxide [1]

- (c) The unreactive, non-metallic element [1]

- (d) Two elements that exists as diatomic molecules [1]

- (e) Two elements that react to form an covalent compound with the formula of X_2Y , where X & Y represents the respective symbols of the two elements. [1]

Question 2 [7 mks]

Give one reason in each case to explain each of the following statements:

- (a) Many covalent compounds have low melting points [2]

- (b) Heat is required to turn a solid into a liquid [2]

- (c) Blue copper(II) sulphate crystals change colour when heated. [1]

- (d) When aqueous potassium iodide is added to acidified potassium manganate(VII) the colour changes from purple to brown. [2]

Question 3 [8 mks]

You are told to prepare a dry sample of calcium chloride crystals.

- (a) Suggest the pair of reactants you could use for the preparation of this salt [2]

- (b) Write a chemical equation (*with state symbols*) for reaction involving your named reactants in part (a). [2]

- (c) Describe the steps to be taken to prepare the dry sample of calcium chloride crystals, using the your answer from (a). [4]

Question B4 [8 mks]

Two of the raw materials required for the production of pig iron in the blast furnace are limestone and haematite.

- (a) Name **two** other raw materials required. [2]

- (b) Why is limestone added to the furnace? [1]

- (c) Suggest why this process cannot be used for the extraction of sodium from sodium chloride. [1]

- (d) Name the method that can be used to extract sodium from sodium chloride. [1]

- (e) Although both pig iron and stainless steel contain iron and carbon, with the latter in varying amount, pig iron and steel have different properties. State **two** difference in properties of these two alloys. [2]

- (f) What is the chemical name for rust? [1]

Question B5 [11 mks]

The amount of metal ores in the Earth's crust is limited and non-renewable and there is a need for conservation and recycling of metals.

- (a) Give **three** ways of conserving metals. [3]

- (b) Give the importance of recycling of metals. [2]

- (c) Give **three** factors in which the availability of a metal depends mainly on. [3]

- (d) What are the **three** factors that determine the choice of one metal over another for making things? [3]

Question B6 [4 mks]

By means of suitable electron diagrams, illustrate the bonding in these two compounds.
(Show only the outer shell electrons)

a. Carbon dioxide (CO₂) [2]

b. Magnesium fluoride (MgF₂) [2]

Question B7 [7 mks]

3.12 g of a sample of anhydrous sodium carbonate is dissolved in distilled water and made up to 250 cm³ of solution. A 25.0 cm³ portion of the solution requires 36.8 cm³ of 0.15 mol/dm³ hydrochloric acid for complete neutralization.

(a) Write the chemical equation, including state symbols, for the reaction between sodium carbonate and hydrochloric acid in the above experiment. [1]

(b) Calculate the number of moles of pure sodium carbonate in 25.0 cm³ of solution. [2]

(c) Calculate the mass of sodium carbonate in 250 cm³ of solution. [2]

(d) Hence, calculate the percentage purity of the sample of sodium carbonate. [2]

The Periodic Table of the Elements

Group																	
I	II	III	IV	V	VI	VII	0										
		1 H Hydrogen 1					4 He Helium 2										
7 Li Lithium 3	9 Be Beryllium 4		11 B Boron 5	12 C Carbon 6	14 N Nitrogen 7	16 O Oxygen 8	19 F Fluorine 9	20 Ne Neon 10									
23 Na Sodium 11	24 Mg Magnesium 12		27 Al Aluminium 13	28 Si Silicon 14	31 P Phosphorus 15	32 S Sulphur 16	35.5 Cl Chlorine 17	40 Ar Argon 18									
39 K Potassium 19	40 Ca Calcium 20		45 Sc Scandium 21	48 Ti Titanium 22	55 Mn Manganese 25	59 Co Cobalt 27	64 Cu Copper 29	73 Ge Germanium 32									
85 Rb Rubidium 37	88 Sr Strontium 38		89 Y Yttrium 39	91 Zr Zirconium 40	96 Mo Molybdenum 42	103 Rh Rhodium 45	108 Ag Silver 47	119 Sn Tin 50									
133 Cs Caesium 55	137 Ba Barium 56		139 La Lanthanum 57	178 Hf Hafnium * 72	184 W Tungsten 74	192 Ir Iridium 77	197 Au Gold 79	207 Pb Lead 82									
226 Fr Francium 87	226 Ra Radium 88		227 Ac Actinium 89			201 Hg Mercury 80	209 Bi Bismuth 83	210 Po Polonium 84									

* 58 – 71 Lanthanoid series
+ 90 – 103 Actinoid series

a	X
b	
Key	

a = relative atomic mass
X = atomic symbol
b = proton (atomic) number

140 Ce Cerium 58	141 Pr Praseodymium 59	144 Nd Neodymium 60	150 Sm Samarium 62	152 Eu Europium 63	157 Gd Gadolinium 64	162 Dy Dysprosium 66	165 Ho Holmium 67	167 Er Erbium 68	169 Tm Thulium 69	173 Yb Ytterbium 70	175 Lu Lutetium 71		
232 Th Thorium 90	238 Pa Protactinium 91	238 U Uranium 92	93 Np Neptunium 93	94 Pu Plutonium 94	95 Am Americium 95	96 Cm Curium 96	97 Bk Berkelium 97	98 Cf Californium 98	99 Es Einsteinium 99	100 Fm Fermium 100	101 Md Mendelevium 101	102 No Nobelium 102	103 Lr Lawrencium 103

The volume of one mole of any gas is 24 dm³ at room temperature and pressure (r.t.p.)