**Chemistry B Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Period\_\_\_\_\_**

**Chemistry Review Set**

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| Do the following problems. Each one is from a topic that was covered in the Chemistry A.  The following questions are a sample of the type of questions that you should be able to answer. |
| 1.     | Complete and balance the following chemical equations.  |
|  | (a) Li + H2O --->  |
|  | (b) Pb(NO3)2  +  NaCl  -------> |
|  | (c) Na2CO3  +  HCl  -------> |
| 2. | Perform the following arithmetic. Round to significant digits. |
|  | (a) (1.0 X 107) X (4.0 X 105)                 (2.0 X 108)  |
|  | (b) (4.0 X 10-5) X (6.0 X 1010)                  (3.0 X 10-2)  |
|  | (c) (5.0 X 10-4) X (2.0 X 10-6)                   (1.0 X 10-12)  |
|  | (d) (3.0 X 104) + (2.1 X 105)  |
|  | (e) (8.0 X 1012)/(2.0 X 10-3)2 |
| 3. |  In what region of the periodic table are the largest atoms found? Where are the smallest atoms found?  |
| 4. | How are isotopes of the same element alike? How do they differ?  |
| 5. | Calculate the formula weight or molecular mass of each substance.  |
|  | (a) Sodium chloride, NaCl |
|  | (b) Sucrose (table sugar), C12H22O11 |
|  | (c) Calcium propionate, Ca(C3H5O2)2, a food additive |
|  | (d) Ferrous ammonium sulphate, (NH4)2Fe(SO4)2 |
| 6. | How many moles of sulphur atoms must be combined with 2.0 mol of iron atoms to give iron pyrite, FeS2?  |
| 7. | Sodium bicarbonate, NaHCO3, is one ingredient of baking powder. In one experiment in a series of tests of different ratios of ingredients, a scientist used 21.0 g NaHCO3. How many moles of NaHCO3 were in this sample? |
| 8. | Balance the following equations:  |
|  | (a) Al2O3 + H2SO4 ----> Al2(SO4)3 + H2O  |
|  | (b) KHCO3 + H3PO4 ----> K2HPO4 + H2O + CO2 |
|  | (c) C9H20 + O2 ----> CO2 + H2O  |
| 9. | What is the Pauli Exclusion Principle? What effect does it have on the populating of orbitals by electrons?  |
| 10. | Predict the electron configurations of (a) S, (b) K, (c) Ti, and (d) Sn. |
| 11. | Lactic acid, the substance that causes sour milk to taste as it does, has a formula weight of 74. It consists of 48.63% C and 8.18% H, with the rest being oxygen. Calculate the empirical and molecular formulas of lactic acid, arranging the atomic symbols in alphabetical order.  |
| 12. | Analysis shows a hydrocarbon to be composed of 80% C and 20% H.  |
|  | a) What is it's simplest (empirical) formula?  |
| 13. | Asbestos, a known cancer-causing agent, has a typical formula, Ca3Mg5(Si4O11)2(OH)2. How many atoms of each element are given in this formula?  |
| 14. | Write the formulas and names of the elements that exist in nature as molecules that are each composed of two atoms (Diatomics).  |
| 15. | Give chemical names for the following.  |
|  | (a) NaClO3                                                            (b) K2Cr2O7 |
|  | (c) HIO3(aq)                                                          (d) MnCl2 |
|  | (e) Ca(H2PO4)2                                                     (f) Ca(CN)2 |
| 16. | Calculate the number of grams of each of the following:  |
|  | (a) 250 mol of NaCl  |
|  | (b) 10 mol of C6H12O6 (glucose) |
|  | (c) 50 mol of H2SO4 |
| 17. | Supply the charge of the cation and anion in the following formulas |
|  |  a) Zn3(PO4)2,                           b) NaNO2,                         c) SnBr2,  |
| 18. | Calculate the mass percentage composition of each compound.  |
|  | a) MgCl2 ,               b) Na2SO4 ,             c) Fe2O3 ,  |
|  | d) C7H5N3O6 ,      e) AlBr3.6H2O |
| 19. | A sample of iron ore weighing 2.80 g is to be analyzed for the percentage of iron. All of the iron in the sample is converted into iron oxide (Fe2O3) which has a mass of 1.00 g. What is the percentage of iron in the ore? |
| 20. | What is the relationship between first ionization energies and metallic and nonmetallic properties?  |
| 21. | How many grams of pure O2 are required to react completely with 2.43 g of magnesium? |
| 22. | Magnesium metal reacts quantitatively with oxygen to give magnesium oxide, MgO. If 5.00 g of Mg and 5.00 g of O2 are allowed to react, what weight of MgO is formed, and which reactant is left in excess?  |
| 23. | Helium has the lowest boiling point of any liquid. It boils at 4 K. What is it's boiling point in oC?  |
| 24. | Calculate the number of grams of sodium peroxide, Na2O2, that would be required to produce 50 g of oxygen by the following reaction; |
|  | 2 Na2O2 + 2 H2O ---> 4 NaOH + O2 |
|  | **Optional Review Set**

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| **1.** | Where is nearly all of the mass of an atom located? Explain your answer in terms of what contributes to this mass.    |
| **2.** | Calcium arsenate, Ca3(AsO4)2, is a poison sometimes used to kill insects on plants. What is the mass of 0.586 mole of calcium arsenate?    |
| **3.** | Calculate the formula weight of Fe4[Fe(CN)6]3. |
| **4.** | Which of the following atomic species have a) 1,     b) 2,   or  c) 3 unpaired electrons in their outer shell?           H, He, Li, Be, C , N, O, F, Ne.    |
| **5.** | Define monoprotic acid, diprotic acid and polyprotic acid.    |
| **6.** | An oxide of a certain element produced an acidic solution when dissolved in water. The oxide has the empirical formula X2O3, where X represents the symbol for the element. Is the element X a metal or a nonmetal? In which group in the periodic table does it belong?    |
| **7.** | Which alkaline earth metal is used in flashbulbs and flares? Why? Explain using a chemical equation.    |
| **8.** | Give Lewis structures for (a) CS2, (b) CN-, (c) SeO3, and (d) SeO2   |
| **9.** | Which of these bonds is most polar and which is least:   SO, ClCl, or   ClO?     Justify your arrangement.    |
| **10.** | Write the formulas for  |
|  | (a) aluminum sulphide         (b) strontium fluoride    |
|  | (c) titanium(IV) oxide         (d) chromous bromide    |
| **11.** | Write molecular, ionic and net ionic equation for the reaction between Pb(NO3)2 and Fe2(SO4)3.   |
| **12.** | One way to prepare iodine is to mix sodium iodate, NaIO3, with hydriodic acid, HI. The following reaction occurs.    |
|  | NaIO3 + 6 HI --------> 3 I2 + NaI + 3 H2O   |
|  | Calculate the number of moles and the number of grams of iodine that can be made this way from 16.4 g of NaIO3.  |

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[**Answers**](http://www2.ucdsb.on.ca/tiss/stretton/CHEM2/answers_index.html)