

**Learning Objectives: Descriptive Chemistry – Part 1****Instructor:** Dr. Francesca (Fran) M. Kerton**Phone:** 737-8089**Office:** C4007 **Lab:** C5006**e-mail:** [fkerton@mun.ca](mailto:fkerton@mun.ca) (include Chem 1051 in the title of any e-mails sent to me)

After students have studied the material covered in the lectures and in the relevant sections of the required text (General Chemistry 9th Ed., by Petrucci/Harwood/Herring/Madura; Prentice Hall 2007). Please study using Dr. Flinn's worksheet, Descriptive Chemistry Review for Test #1 (see <http://www.chem.mun.ca/~cgflinn/chem1051/>)

**Students should be able to:**

1. Identify the central ions and the ligands, determine the coordination number and the oxidation state of the central ion, and establish the net charge on a complex ion.
2. Give the formulae of some common monodentate and polydentate ligands.
3. Describe the uses of hydrogen, and write chemical equations for its preparation and use.
4. Write chemical equations for  $H_2$  acting as a reducing agent.
5. Describe and explain the properties of the group 1 and 2 elements (alkali metals and alkaline earth metals).
6. Outline the methods that are used to produce Na and Mg.
7. Write equations to show the effect of  $H_2O$ ,  $HCl_{(aq)}$  and  $HC_2H_3O_2_{(aq)}$  on the metals of group 1 and 2.
8. Know the chemical formulae for the important calcium compounds; quick lime, slaked lime and limestone.
9. Write equations for the thermal decomposition of group 1/2 carbonates and hydrogen carbonates, the reaction of group 1/2 carbonates and hydrogen carbonates with acids and the formation of plaster of Paris from gypsum.
10. Know that group 1/2 oxides are basic materials and write equations for their reactions with water.
11. Describe the formation of stalactites and stalagmites in limestone caves.
12. Describe the lab test for  $CO_2$ .
13. Describe the general properties of the transition elements e.g. good electrical conductors, many act as heterogeneous catalysts.
14. Describe and explain the properties of the first transition series (Sc to Zn), including electron configurations, atomic (metallic) radii and oxidation states.
15. Write equations to show their reaction with  $HCl_{(aq)}$ .
16. Describe ferromagnetism and the features of atomic structure that lead to it.
17. Explain why most transition metal coordination compounds are coloured.
18. Compare and contrast the properties of the transition and main group elements.