ADDIS ABABA SCIENCE AND TECHNOLOGY UNIVERSITY
COLLEGE OF APPLIED SCIENCES
DEPARTMENT OF INDUSTRIAL CHEMISTRY
General Chemistry (Chem. 1011)
Work Sheet I

1. A bar of copper has a mass of 216 g and a volume of 24 cm^3. What is the density of copper?
2. The volume of a candy bar is 55 cm^3. The mass of the candy bar is 70 g. What s the density of the candy bar?
3. An ice cube has a volume of 36 cm^3. If the ice cube has a mass of 33.2 g, what is the density of the ice cube? What is the density of water?
4. At 4°C, pure water has a density of 1 g/mL (1 g/cm^3). Suppose that you have 2 liters of pure water at this temperature. What is the mass of this water? What is the mass of ethyl alcohol?
5. What is the mass of ethyl alcohol that exactly fills a 200.0 mL graduated cylinder. The density of ethyl alcohol is 0.789 g/mL.
6. What is the volume of a silver metal that has a mass of 2500.0 g. The density of silver is 10.5 g/cm^3.
7. All chemical properties are intensive. None are extensive. Why? Explain!
8. Which are better characteristic properties? Intensive properties or Extensive properties?
9. What state of matter has definite volume and definite shape?
10. Describe the properties of liquids.
11. Describe the differences between gases and plasma.
12. What is needed for states of matter to change phase?
13. How many atoms of each element are present in one molecule of: $(NH_4)_2SO_3$
14. What is a solution?
15. Why does every sample of a given substance have the same properties?
16. Explain why the composition of an element is fixed.
17. Describe the composition of a compound.
18. Why can the properties of a mixture vary?
19. On what basis can mixtures be classified as solutions, suspensions, or colloids?
20. Express each number in scientific notation.
    a. 3265
    b. 0.000028
21. An iron sample has a mass of 4.50 lbs. What is the mass of this sample in grams?
22. At what temperature does °C = °F?

23. A certain mineral has a mass of 17.8 g and a volume of 2.35 cm^3. What is the density of this mineral?
24. What is the mass of a 49.6-mL sample of a liquid, which has a density of 0.85 g/mL?
25. What happens if you raise the temperature to super-high levels between 1000°C and 1,000,000,000°C? Will everything just be a gas?
26. The Sun is an example of a star in its plasma state. True or False?
27. Classify the following as an element, compound, or mixture (heterogeneous or homogeneous). Air, oxygen, tin can, sugar, Windex, crude oil, suntan lotion and gummi bear
28. A white solid is dissolved in water. The resulting colorless, clear liquid is boiled in a beaker until dryness. White crystals remain in the beaker. The liquid can be classified as a(n) _____.
29. Classify the following as physical or chemical changes. Photosynthesis, baking, writing with pencil and snowing
30. Classify the following as an element, compound, or mixture (heterogeneous or homogeneous). Wine, root beer, penny, table salt, bleach, wood, diamond and vinegar.
31. A clear blue liquid in an open beaker was left in the hood. After 1 week, the beaker contained only blue crystals. The original liquid can be classified as a(n) _____.
32. Classify the following as physical or chemical changes. Perspiration, sugar dissolving, fermentation and aging.
33. A colloid can be separated by filtration. True or false?
34. After passing through a muddy pond, the water in a stream contains dirt particles. Which of the following describes the stream? Solution, suspension, pure substance and colloid.
35. Which of the following will show the Tyndall Effect? Water, sugar water, oxygen gas and fog.
36. Which of the following is a colloid? Milk, NaCl in water, sand and water and raisin bread.
37. Is changing phase a physical or chemical change?
38. Think of that air you are breathing in right now. What are some components of air? Why might air be referred to as a mixture?
39. Define substances and mixtures. Identify elements and compounds. Compare and contrast solutions, colloids, and suspensions.
40. What do the small numbers (subscripts) represent in H_2O?
41. Can an element or a compound be broken down into simpler parts?
42. What is an example of a pure substance?
43. What are the building blocks of elements?

44. What is the difference between a homogeneous and a heterogeneous substance?
45. When substances dissolve and form a homogeneous mixture, the mixture that forms is called a_____.
46. Is fog an example of a colloid or a suspension?
47. A heterogeneous mixture that separates into layers over time is called a_____
48. A _____is a substance whose particles are dissolved in a solution.
49. The substance in which the solute dissolves is called the _____.
50. Sugar in water – circle the solvent and underline the solute
51. What is one of the three common types of evidence of a chemical change?
52. Any solid that forms and separates from a liquid mixture is called a_____
53. Gasoline and paper is an example of what chemical property?
54. What is the PERIODIC TABLE? Who invented it? What is the ATOMIC NUMBER? What is the SYMBOL? What is the ATOMIC WEIGHT?
55. Name a metal in group 1 that is in the same period as Magnesium.
56. Name a metal in group 2 that in the same period as Lithium.
57. Name a non-metal in the same group as Nitrogen.
58. When you react Magnesium with Oxygen you get:
    a. Oxygen magnesimide b. Magnesium oxygen
    c. Magnesium oxide d. Magnesium oxate
59. One of the products of the thermit reaction is:
    a. Iron oxide b. Aluminium c. Carbon d. Iron
60. Sodium is in the same group as:
    a. Magnesium b. Aluminium c. Potassium d. Neon
61. The colour of Magnesium oxide is:
    a.White b. Black c. Silver d. Brown
62. Calcium Carbonate does not contain:
    a. Hydrogen b. Oxygen c. Carbon d. Calcium
63. How many atoms of Hydrogen in one molecule of Methane CH_4 ?
64. How many atoms of Nitrogen in one molecule of Lead nitrate $Pb(NO_3)_2$?
65. Sodium oxide has two atoms of sodium for every atom of oxygen. What is the formula for sodium oxide?
66. Magnesium chloride has one atom of Magnesium for every two atoms of chlorine. What is the formula for Magnesium chloride?
67. How many atoms of Nitrogen in one molecule of Ammonia NH_3?
68. How many atoms of Oxygen is there is <u>two</u> molecules of $CuSO_4$?
    a.1 b. 4 c. 6 d. 8

By: Medhanie G.

69. Give the symbol and atomic number for each of the following elements. Also indicate whether each element is a metal or a nonmetal. Argon, Chlorine, Barium and Cesium.
70. The nucleus of an atom contains:
    a. Protons and neutrons
    b. Electrons and neutrons
    c. Protons and electrons.
    d. Protons, neutrons, and electrons.
71. Two atoms with the same atomic number but different mass numbers are called?
    a. Mutants b. Isomers c. Isotopes d. Symbiots
72. The elements found on the right side of the periodic table tend to _____ electrons.
    a. Gain b. Lose c. Keep d. Share
73. Metals and nonmetals react to form _____ compounds.
    a. Molecular b. Mixed c. Empirical d. Ionic
74. Positive ions are called?
    a. Positrons b. Anions c. Cations d. Nucleons.
75. Compounds composed only of carbon and hydrogen are called?
    a. binary acids b. Carbohydrates c. Hydrocarbons d. Alkanes.
76. The elements located in Group VIIA (Group 17) on the periodic table are called?
    a. Alkali metals b. Noble gases c. Chalcogens d. Halogens.
77. Which name is incorrectly paired with the formula?
    a. Hydroxide ion; OH^-
    b. Ammonia; NH_3
    c. Barium(II) chloride; $BaCl_2$
    d. Sulfur dioxide; SO_2
78. NaOCl is named?
    a. Sodium chlorate
    b. Sodium perchlorate
    c. Sodium chlorite.
    d. Sodium hypochlorite.
79. $LiNO_3$ is named?
    a. Lithium nitrate b. Lanthanum nitrate c. Lanthanum nitrite d. Lithium nitrite
80. The formula for aluminum carbonate is?
    a. $Al_2(CO_3)_3$ b. $AlCO_3$ c. Al_2C_3 d. $Al_3(CO_3)_2$
81. A certain isotope X contains 23 protons and 28 neutrons. What is the mass number of this isotope? Identify the element.