

Chemistry 100

Study Guide for Exam 1 (Wednesday, September 17th)

The main topics to study for the exam, along with some previous exam questions are provided below.

Chapter 1

- Scientific method
- Conversions
- Chemical and physical properties and changes
- Elements, mixtures, compounds

Sample questions:

1. Convert 356 g into mg
2. Convert 75 mL into L
3. Distinguish between a scientific hypothesis and a theory.
4. Why are theories never proven in science?
5. Evaluate the following scientific claim: *A man says he can bend spoons with his mind if he is not exposed to negative vibrations from skeptical observers. Many people have admitted to observing him accomplish this with their own eyes.*
6. Classify each of the following as a chemical or physical change: (a) water boils (b) grape juice turns to wine.
7. Identify the following substances as mixtures (M), compounds (C) or elements (E). (a) oxygen gas (b) light salt (potassium chloride) (c) ketchup (d) ocean water
8. Suggested Problems from the text: Chapter 1, questions 7, 11, 15

Chapter 2 and Related Topics

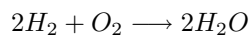
- valence electrons, electron configuration
- ionic bonding and covalent bonding
- formation of ions
- formulas for ionic compounds, names of ionic compounds
- electron dot structures of atoms and simple covalent compounds
- atomic number, mass number, isotopes
- minerals - definition
- significance of the Copper Age
- oxidation/reduction (definitions, identifying)
- writing and balancing chemical equations
- molar mass
- converting grams to moles and moles to grams
- mole relationships in chemical equations

A Few Sample questions:

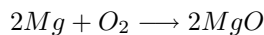
1. Complete the following table for neutral atoms:

Symbol	Atomic number	Mass number	number of protons	number of neutrons	Number of electrons
	2			1	
			8	7	
	26	56			

2. How many electrons are in the outer most shell of neon (Ne)?
3. What is the chemical formula of the ionic compound formed from barium and chlorine? Lithium and sulfur?
4. Name the following compounds: CaCl_2 , KI, MgO, Al_2O_3 .
5. Draw the Lewis Dot Structure for the molecule HI (hydrogen iodide).
6. Draw the Lewis Dot Structure for the molecule CHCl_3
7. Identify the ion that atoms of the following elements tend to form: K, S, Br, Ca (Give the ionic symbol with charge: e.g. Li forms Li^+)
8. Is this reaction balanced? (yes or no) $\text{NO} + \text{O}_2 \rightarrow \text{NO}_2$
9. Balance the following equation: $\text{C}_7\text{H}_{16} + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$
10. Balance the following equation: $\text{SO}_2 + \text{O}_2 \rightarrow \text{SO}_3$
11. What is the molar mass of hexane, C_6H_{14} ?
12. What is the molar mass of $\text{Ba}(\text{NO}_3)_2$?
13. Calculate the number of moles in 45.2 g of NaOH.
14. How many grams are there in 0.113 moles of CaCl_2 ?
15. Consider the equation for the production of H_2O . How many grams of hydrogen (H_2) is needed react completely with 100 grams of oxygen (O_2) ?



16. In the following reaction, which element is oxidized?



17. Suggested Problems from the text: Chapter 2 questions 13, 15, 21, 31, 43