Polytechnic Tutoring Center

Midterm I REVIEW Answer Key – CM 1014, Fall 2020

Disclaimer: **This mock exam is only for practice**. *It was made by tutors in the Polytechnic Tutoring Center and is not representative of the actual exam given by the Academic Department.*

The Exam is designed to test concepts, not exact knowledge so please do not worry if some questions seem outside of what you have learned. Watch the solution video when uploaded to see the method of solving each of these problems. The main focus is to understand the approach to problem solving.

PART I

1. CH2 and C6H12, Assume 100g, multiple mass by percent composition, convert to moles, divide into whole numbers to get empirical formula, divide by molecular mass for molecular formula.
2. (533g)Fe / (681.81g)Fe = 78%, Convert to moles of Fe_3O_4 to moles of Fe, the nto expected grams. Divide the experimental value by the accepted.
3. 2.81 x 10^20. Convert to moles of K_2MnF_6 then to moles of K, then multiply avogadro's number

Reminder For exam one: the following topics will be covered. Please go through the list.

PART II

1. B, solve for the volume of water then the density of sulfuric acid mass
2. C, write out a balanced equation, convert to moles of O2, then to grams of O2
3. A, divide mass of total iron by mass of total molecule
4. B divide weight of U by K
5. A, alkali metal is group 1, halogen is group 7, transition in D block, Noble gas is the last group. You should know names of all groups.
6. C, definition of ionic compound
7. A, subtract atomic number from 40
8. B, definition of a mole
9. B, balance Cl before O
10. C, cobalt III bonds with 3 chlorines. There may be some confusion about this problem. For the nonmetal part, without prefix usual implies 1, however, there are three Cl here. The reason why it is still chloride alone is because the charge of cobalt is marked and we know the charge of Cl is -1 So it's unnecessary to say trichloride
11. A, NO_3 has -1 charge
12. D, assume 100g and multiple each mass by it's percent abundance
13. D, convert to moles and multiply by avogadro's number
14. E, melting point is a physical property, chemical properties need a change of matter.
15. C, mass is extensive, intensive properties does not concern the amount of matter.

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Ch 2Atomic number, mass number, isotopes / Formulas, names and charges of common ions /Ionic vs molecular compounds/ Empirical vs molecular formulas/ Naming ionic and molecular compounds

Ch 3Atomic and molecular mass vs molar mass / Conversion of grams to moles to molecules / Percent composition to empirical formula / Relating amounts of reactants to amounts of products/ Limiting reagents, theoretical yields, % yields