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1 General Chemistry: 40 Points

Show all of your work on scratch paper! You may use a notes sheet that you have prepared and the periodic table. Maximum one page.

1.1 Stoichiometry and Chemical Terminology: 24 Points

- (3 points) Find the molar mass of nitric acid.
- (4 points) Find the number of moles in 1000.0 kilograms of sodium nitrate.
- (11 points) Methane (CH_4) combusts in oxygen to form carbon dioxide and water.
 - (5 points) Find the limiting reagent of a reaction between 100.0 grams of methane and 200.0 grams of oxygen.
 - (4 points) Find the theoretical yield in grams of water.
 - (3 points) Find the percentage yield if the combustion results in 100.0 grams of water.
- (4 points) Balance: $(CN)_2 + NaOH \rightarrow NaCN + NaOCN + H_2O$
- (1 point) Which of the following is *not* true?
 - The atom is the fundamental building block of matter.
 - A substance cannot be separated into its components by chemical means.
 - In a solution, the concentrations of each substance are constant throughout the solution.
 - There exist elements which are not molecules in standard form.

1.2 Nomenclature: 16 Points

Write the formula (charge included) for each ion (2 points each).

- Plumbic
- Nitrate
- Stannous
- Cuprous
- Bicarbonate
- Acetate
- Ammonium
- Sulfide

General Chem Answers

1.3 Stoichiometry Answers

- 63.02 Grams per Mole *Scoring:* 1 point for the answer, 1 points for the work, 1 point for the units
- 11.77 Moles *Scoring:* 1 point for the answer, 1 point for the molar mass, 1 point for the units, 1 point for work
- Oxygen *Scoring:* 1 point for the answer, 1 point for the calculated moles, 1 point for the stoichiometric ratio, 2 points for completeness of work
 - 112.63 grams *Scoring:* 1 point for the answer, 1 point for the molar mass of water, 2 points for the completeness of work
 - 88.8% *Scoring:* 1 point for the answer, 1 point for the formula, 1 point for the completeness of work
- 1, 2, 1, 1, 1 *Scoring:* 0-2 points for work, 0.5 points per coefficient in ratio to the coefficient for water.
- B *Scoring:* 1 point for the answer.

1.4 Nomenclature Answers

Scoring: One point for formula, one point for charge

- Pb^{4+}
- NO_3^-
- Sn^{2+}
- Cu^+
- HCO_3^-
- $C_2H_3O_2^-$
- NH_4^+
- S^{2-}