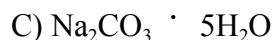
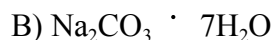
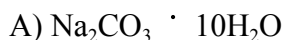


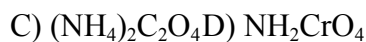
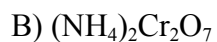
_____ 1) Which of the compounds contains the largest percentage of oxygen by mass?



_____ 2) When a hydrate of Na_2CO_3 (106 g/mol) is heated until all the water (18 g/mol) is removed, it loses 54.3 percent of its mass. The formula of the hydrate is



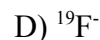
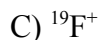
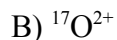
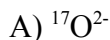
_____ 3) The correct formula for the compound ammonium dichromate is



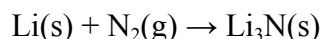
_____ 4) A covalent compound is found to have an empirical formula of $\text{C}_2\text{H}_5\text{O}$. The molar mass of the compound is found to be approximately 135 grams per mole. What is its molecular formula?



_____ 5) An ion has 8 protons, 9 neutrons, and 10 electrons. The symbol for the ion is

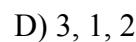
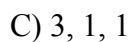
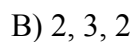
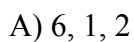


Lithium and nitrogen react in a combination reaction to produce lithium nitride:

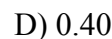
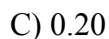
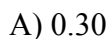


Use this information to answer the next two questions.

_____ 6) When the equation above is balanced correctly, the coefficients are, respectively,



_____ 7) How many moles of lithium are needed to produce 0.60 mol of Li_3N when the reaction is carried out in the presence of excess nitrogen?



Ethanol, $\text{C}_2\text{H}_5\text{OH}$, is a renewable fuel produced from the fermentation of vegetable matter such as corn. As with all such combustion reactions, water and carbon dioxide are products.

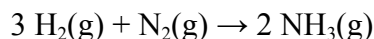
_____ 8) In a balanced equation for the combustion of ethanol with oxygen, the coefficients for ethanol and oxygen are, respectively,

- A) 1, 3 B) 2, 6 C) 1, 5 D) 1, 4

_____ 9) How many grams of water are produced by the combustion of 9.20 grams of ethanol?

- A) 6.0 grams B) 8.40 grams C) 10.8 grams D) 25.2 grams

The production of ammonia, NH_3 , from nitrogen and hydrogen is one of the largest commercial chemical processes:



You will use the following quantities of reactants to answer the next three questions.

- I. 800 molecules of hydrogen and 300 molecules of nitrogen
- II. 5 moles of hydrogen and 1 mole of nitrogen
- III. 600 molecules of hydrogen and 200 molecules of nitrogen
- IV. 1000 molecules hydrogen and 400 molecules of nitrogen

_____ 10) In which reaction system above are the reactants in perfect stoichiometric ratio?

- A)I B)II C)III D)IV

_____ 11) In which reaction system(s) above is hydrogen the reactant present in excess?

- A)I B)II C)I and III D)I and IV

_____ 12) Which reaction system above is capable of producing a maximum of 400 molecules of ammonia?

- A)I B)II C)III D)IV