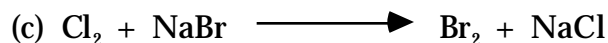
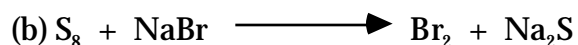
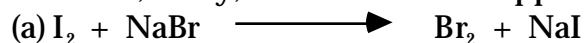


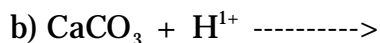
Name: _____

Periodic Table and Chemical Reactions: Test 3

1. Joe Indium, professor Sally Samarium's lab assistant, was asked to set up a lab in which the procedure called for an aqueous solution of bromine (bromine water). Since there was no bromine in the stockroom, Joe decided to produce it by oxidizing a solution of NaBr. He came up with three possibilities, which are listed below. Which of the following unbalanced reactions, if any, would be best? Support your answer.

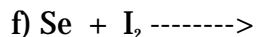


2. Soil that is too acid is often treated with lime, CaO, or with CaCO₃ to neutralize the excess acid even though neither of these substances contain the hydroxide ion. Explain with reactions how these materials are able to neutralize acids in the soil.



3. The product of the reaction of phosphorous with an excess of sulfur is used in matches. Predict probable empirical formulas for this compound.

4. Complete and balance four of the following:



5. The medical laboratory test for the cyanide ion, CN^{1-} , involves the addition of sulfuric acid to the body fluid to be analyzed. This allows the cyanide to escape in a gaseous product which is then reacted with (dissolved in) a sodium hydroxide solution. Write the two equations for this procedure. (The first reaction has been started for you.)



b)

6. With regard to periodic trends and the position of the elements on the periodic chart answer the following:

a) the trend for basic strength of the hydroxides in periods.

b) the strongest oxidizing agent for aluminum: Si, P, S, or Se.

c) the trend of metallic character of a period.

d) the stronger reducing agent, Na, Mg, Al, or S.

e) the trend for the size of the atoms in groups.

f) more easily reduced by magnesium: P_4 , S_8 , Cl_2 , or Br_2 .

7. Given the unbalanced equation:



Identify each of the following:

substance oxidized: _____

substance reduced: _____

oxidizing agent: _____

reducing agent: _____

8. Everyone knows that snow exists and if it comes at the proper time can cause great rejoicing among students and faculty. However, what are the chances that either SNOW, SnOW, or SNoW could exist from the standpoint of oxidation states and electronegativity considerations? If you find that one is probable, what molecular structure would you predict for the compound? (Note. The possible oxidation states for tungsten are 2+, 3+, 5+, and 6+. Nobelium seems to exhibit only the 3+ state.)

One Step Beyond (Extra Credit)

1. Which piece of laboratory glassware is the smartest?

Twilight Zone (Extra Credit)

1. A sample of cocaine, $\text{C}_{17}\text{H}_{21}\text{O}_4\text{N}$, known to have been diluted with sucrose, $\text{C}_{12}\text{H}_{22}\text{O}_{11}$, was brought to Professor Erbie Terbium's laboratory for analysis. Professor Terbium gave the sample to Dr. Wolfram Boron, his understudy, to do the actual analysis. Dr. Boron burned a 1.00 mg sample of the mixture in oxygen and obtained exactly 2.00 mg of carbon dioxide. What was the percentage of cocaine in the sample.