

3 · Molecules & Compounds

AP QUESTION—First Look

Problem vs. Exercise

An **exercise** is a calculation or other task where you know what to do. You are doing repeated examples to build up your skill, your speed, and your experience.

A **problem** is a situation in which you do *not* know what to do. So... what do you do when you do not know what to do? Read the problem, read it again, read it again, calculate a few things, read it again, and hopefully things fall into place. **YOU LEARN TO SOLVE PROBLEMS BY SOLVING PROBLEMS!** You add ideas to your “bag of tricks.”

1982 B

Water is added to 4.267 grams of UF_6 . The only products are 3.730 grams of a solid containing only uranium, oxygen and fluorine and 0.970 gram of a gas. The gas is 95.0% fluorine, and the remainder is hydrogen.

- (a) From these data, determine the empirical formula of the gas.

- (b) What fraction of the fluorine of the original compound is in the solid and what fraction in the gas after the reaction?

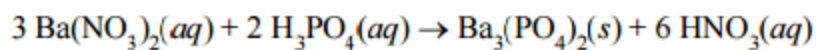
- (c) What is the formula of the solid product?

Note: There is also a part (d) that we would not yet know how to do.

2003B

Answer the following questions that relate to chemical reactions.

- (b) In a reaction vessel, 0.600 mol of $\text{Ba}(\text{NO}_3)_2(s)$ and 0.300 mol of $\text{H}_3\text{PO}_4(aq)$ are combined with deionized water to a final volume of 2.00 L. The reaction represented below occurs.



- (i) Calculate the mass of $\text{Ba}_3(\text{PO}_4)_2(s)$ formed.