Percent Composition Problems

1. Determine the percent composition for each element in each of the following compounds:
2. sodium oxalate
3. ethanol (C2H5OH)
4. aluminum oxide
5. potassium sulfate
6. Calculate the mass of the given element in each of the following compounds:
7. Bromine in 50.0 g of potassium bromide.
8. Chromium in 1.00 kg of sodium dichromate.
9. Nitrogen in 85.0 mg of the amino acid lysine (C6H14N2O2)
10. Calculate the percentage of water in each of the following hydrates:
11. Sodium carbonate decahydrate
12. Nickel (II) iodide hexahydrate
13. A mass spec analysis of an unknown white crystal comes back as 44.59% Na, 12.02% C, and 47.29% O. Identify the empirical formula for the ionic compound and name it.
14. A compound contains 57.54% C, 3.45% H, and 39.01% F. What is its empirical formula?
15. A compound is found to contain 50.05 % sulfur and 49.95 % oxygen by weight. What is the empirical formula for this compound? The molecular weight for this compound is 64.07 g/mol. What is its molecular formula?
16. A compound is found to contain 64.80 % carbon, 13.62 % hydrogen, and 21.58 % oxygen by weight. What is the empirical formula for this compound? The molecular weight for this compound is 148.08 g/mol. What is its molecular formula?
17. Ammonia reacts with phosphoric acid to form a compound that contains 28.2% nitrogen, 20.8% phosphorous, 8.1% hydrogen and 42.9% oxygen.
18. Calculate the empirical formula of this compound.
19. Assuming the product is an ionic salt, determine the molecular formula and name the compound.

Answers

1a 34.31%Na, 17.93%C, 47.76%O

1b 52.13%C, 13.15%H, 34.72%O

1c 52.92%Al, 47.08%O

1d 44.87%K, 18.40%S, 36.72%O

2a 33.6g Br

2b 397 g Cr

2c 16.3mg N

3a 62.97% water

3b 25.71% water

4 Sodium carbonate, Na2CO3

5 C7H5F3

6 empirical = SO2 molecular = SO2

7 empirical = C4H10O molecular = C8H20O2

8a N3H12PO4

8b (NH4)3PO4