2 past decimal!

Percent Composition
Chemistry

Name: Key! Period: _____ Date: _____

Calculate the percent of the element(s) that is bold in the following compounds.

1. **Ca**$(CN)_2$

$\frac{40.078\,u\,Ca}{92.114\,u\,Ca(CN)_2} \times 100 = 43.51\%$

2. Ammonium **oxalate** $(NH_4)_2C_2O_4$

C_2O_4 : $\frac{88.018\,u\,C_2O_4}{124.0952\,u\,(NH_4)_2C_2O_4}$

70.93%

3. **Na**Br

$\frac{22.990\,u\,Na}{102.894\,u\,NaBr} \times 100 = 22.34\%$

4. **Zinc(II)** sulfide

$\frac{65.38\,u\,Zn}{97.445\,u\,ZnS} \times 100 = 67.09\%$

5. **Oxygen** in acetate $C_2H_3O_2$

$\frac{2(15.999)\,u\,O_2}{59.0437\,u\,C_2H_3O_2} \times 100 = 54.19\%$

Calculate the percent of each element in the following compounds.

6. $AlPO_4$

Al – $\frac{26.982\,u\,Al}{121.952\,u\,AlPO_4} \times 100 = 22.13\%$

P – $\frac{30.974\,u\,P}{121.952\,u\,AlPO_4} \times 100 = 25.40\%$

O_4 – $\frac{63.996\,u\,O}{121.952\,u\,AlPO_4} \times 100 = 52.48\%$

7. Cobalt (II) phosphate – $Co_3(PO_4)_2$

Co_3 – $\frac{176.799\,u\,Co}{366.739\,u\,Co_3(PO_4)_2} \times 100 = 48.21\%$

P_2 – $\frac{61.948\,u\,P}{366.739\,u\,Co_3(PO_4)_2} \times 100 = 16.89\%$

O_8 – $\frac{127.992\,u\,O}{366.739\,u\,Co_3(PO_4)_2} \times 100 = 34.90\%$

8. The compound mannitol, $C_6H_8(OH)_6$, is used as a sweetener in some dietetic foods. What is the percentage composition of each element in this compound?

C_6 - $\frac{72.066\,u\,C}{182.1706\,u\,C_6H_8(OH)_6} \times 100 = 39.56\%$

H_{14} - $\frac{14.1106\,u\,H}{182.1706\,u\,C_6H_8(OH)_6} \times 100 = 7.75\%$

O_6 - $\frac{95.994\,u\,O}{182.1706\,u\,C_6H_8(OH)_6} \times 100 = 52.69\%$

9. Caffeine, $C_8H_{10}N_4O_2$, and theophylline, $C_7H_8N_4O_2$, are both found in tea leaves, and both are used as medicines affecting hormone action in the human body. Compare the percentage of nitrogen found in the two compounds.

Caffeine - N_4 - $\frac{56.028\,u\,N}{194.1934\,C_8H_{10}N_4O_2} \times 100 = 28.85\%$

Theophylline - N_4 - $\frac{56.028\,u\,N}{180.1662\,C_7H_8N_4O_2} \times 100 = 31.10\%$

Caffeine has less nitrogen compared to atoms vs. theophylline.

10. Sodium Stearate ($C_{17}H_{35}COONa$) is a common compound found in bar soap. Determine the percent composition of each element in sodium stearate.

C_{18} - $\frac{216.198\,u\,C}{306.4625\,u\,C_{17}H_{35}COONa} \times 100 = 70.55\%$

H_{35} - $\frac{35.2765\,u\,H}{306.4625\,u\,C_{18}H_{35}O_2Na} \times 100 = 11.51\%$

O_2 - $\frac{31.998\,u\,O}{306.4625\,u\,C_{18}H_{35}O_2Na} \times 100 = 10.44\%$

Na - $\frac{22.990\,u\,Na}{306.4625\,u\,C_{18}H_{35}O_2Na} \times 100 = 7.50\%$