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% composition

1) given formula \rightarrow find Mm \rightarrow %'s

2) given mass data

$$\frac{\#g \text{ element}}{\#g \text{ sample}} \times 100\% \quad \frac{\text{part}}{\text{whole}}$$

3) Given %'s find empirical formula

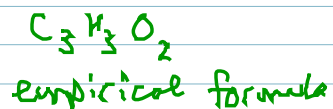
Sample data: 50.7% C, 4.23% H, 45.1% O

$$C: 50.7g \times \frac{1 \text{ mole}}{12.01g} = \frac{4.2215}{2.8188} = 1.5 \times 2 = 3$$

$$H: 4.23g \times \frac{1 \text{ mole}}{1.01g} = \frac{4.1881}{2.8188} = 1.5 \times 2 = 3$$

$$O: 45.1g \times \frac{1 \text{ mole}}{16.00} = \frac{2.8188}{2.8188} \rightarrow 1 \times 2 = 2$$

\downarrow 0.1 10.9



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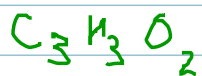
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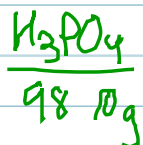
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empirical formula

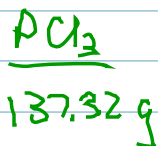
Which sample has more P by mass?

5.95g H_3PO_4 or 7.82g PCl_3



$$P: \frac{30.97g}{98.00g} \times 100\% = 31.60\%P$$

$$5.95g \times \frac{31.60gP}{100g} = 1.88gP$$



$$P: \frac{30.97g}{137.32g} \times 100\% = 22.55\%P$$

$$7.82g PCl_3 \times \frac{22.55gP}{100g PCl_3} = 1.76gP$$