

A compound formed of only phosphorous and oxygen is found to be 56.35% phosphorous. What is the empirical formula of the compound?

Solution 1



$$x : y = \omega(P)/M(P) : \omega(O)/M(O) = 56.35/31 : (100-56.35)/16 = 1.8 : 2.7 = \mathbf{2 : 3}$$



Solution 2

Usually O forms compounds as a O²⁺, so we can assume, that formula of the P_xO_y is actually P₂O_y, so

$$\omega(P) = 2 * M(P) * 100\% / 2 * M(P) + y * M(O)$$

$$56.35 = 2 * 31 * 100 / 2 * 31 + y * 16$$

$$9.016y = 27.063$$

$$y = 3$$

