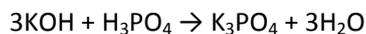


Answer on Question #40465 - Chemistry – Other

Question

In the following reaction, how many grams of potassium phosphate, K_3PO_4 , will be produced from 62.3 g of potassium hydroxide, KOH?



Answer:

Molar mass of KOH equals:

$$M(KOH) = M(K) + M(O) + M(H) = 39.1 + 16.0 + 1.008 = 56.108 \frac{g}{mol}$$

Mass of 3 moles of potassium hydroxide equals:

$$3 \cdot 56.108 = 168.324 \text{ g}$$

Molar mass of K_3PO_4 equals:

$$M(K_3PO_4) = 3M(K) + M(P) + 4M(O) = 3 \cdot 39.1 + 30.97 + 4 \cdot 16.0 = 212.27 \frac{g}{mol}$$

Therefore, mass of 1 mole of potassium phosphate equals 212.27 g.

Then we make a proportion:

168.324 g of KOH react to produce 212.27 g of K_3PO_4

62.3 g of KOH – x g of K_3PO_4

$$x = \frac{62.3 \cdot 212.27}{168.324} = 78.6 \text{ g}$$

Answer: $m(K_3PO_4) = 78.6 \text{ g}$.