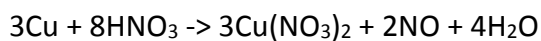


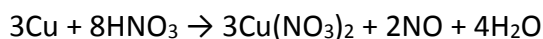
Answer on Question #63452 - Chemistry – General Chemistry



If 400 grams of Cu is reacted with 650 grams of HNO_3 , which is the limiting reagent?

How many grams of $\text{Cu}(\text{NO}_3)_2$ will be produced?

Solution.



1) $M(\text{Cu}) = 64 \text{ g/mol}$; $M(\text{HNO}_3) = 1 + 14 + 16 \times 3 = 63 \text{ g/mol}$;

$$M(\text{Cu}(\text{NO}_3)_2) = 64 + (14 + 48) \times 2 = 188 \text{ g/mol}$$

2) $v(\text{Cu}) = m/M = 400/(3 \times 64) = 2.08 \text{ mol}$

$$v(\text{HNO}_3) = m/M = 650/(8 \times 63) = 1.29 \text{ mol}$$

$$v(\text{Cu}) > v(\text{HNO}_3)$$

HNO_3 is the limiting reagent

3) $(8 \times 63) \text{ g HNO}_3 - (3 \times 188) \text{ g Cu}(\text{NO}_3)_2$

$$650 \text{ g HNO}_3 - x \text{ g Cu}(\text{NO}_3)_2$$

$$x = (650 \times 3 \times 188) / (8 \times 63) = 727 \text{ g}$$

Answer: $m(\text{Cu}(\text{NO}_3)_2) = 727 \text{ g}$