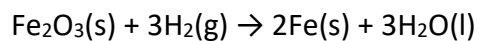


Answer on Question #82445 – Chemistry – General Chemistry

For each of the following reactions, calculate the grams of indicated product when 16.6 g of the first reactant and 10.4 g of the second reactant is used: $\text{Fe}_2\text{O}_3(\text{s}) + 3\text{H}_2(\text{g}) \rightarrow 2\text{Fe}(\text{s}) + 3\text{H}_2\text{O}(\text{l})$ (Fe)

Solution:



$$n(\text{Fe}_2\text{O}_3) = m(\text{Fe}_2\text{O}_3) / M(\text{Fe}_2\text{O}_3) = 16.6 \text{ g} / 159.69 \text{ g/mol} = 0.1 \text{ mol}$$

$$n(\text{H}_2) = m(\text{H}_2) / M(\text{H}_2) = 10.4 \text{ g} / 2.0 \text{ g/mol} = 5.2 \text{ mol}$$

$$n(\text{H}_2) (\text{excess}) > n(\text{Fe}_2\text{O}_3)$$

$$n(\text{Fe}) = 2 \times n(\text{Fe}_2\text{O}_3) = 2 \times 0.1 \text{ mol} = 0.2 \text{ mol}$$

$$m(\text{Fe}) = n(\text{Fe}) \times M(\text{Fe}) = 0.2 \times 55.85 = 11.17 \text{ g}$$

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