

Answer on Question #82114 - Chemistry - General Chemistry

Question:

Aqueous sulfuric acid

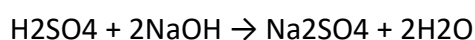
will react with solid sodium hydroxide

to produce aqueous sodium sulfate

and liquid water

. Suppose 53.0 g of sulfuric acid is mixed with 24. g of sodium hydroxide. Calculate the minimum mass of sulfuric acid that could be left over by the chemical reaction. Be sure your answer has the correct number of significant digits.

Solution:



$$n = m/M$$

$$n(\text{H}_2\text{SO}_4) = 31.4\text{g} \times 1\text{mole} / 98.08\text{g} = 0.32 \text{ moles};$$

$$n(\text{NaOH}) = 40.\text{g} \times 1\text{mole} / 40.00\text{g} = 1.0\text{moles};$$

1 mole of NaOH would react with 0.5mole of H₂SO₄, but there's not that much.

0.32 moles H₂SO₄ reacts with 2*0.32 = 0.64 moles NaOH, so H₂SO₄ reacts completely, and 1.0 - 0.640 = 0.36moles NaOH will be unreacted.

0.0g of H₂SO₄ will be left over.

Answer: 0.0g.

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