

## Answer on Question #65459, Chemistry / General Chemistry

Aqueous sulfuric acid

$\text{H}_2\text{SO}_4$

will react with solid sodium hydroxide

$\text{NaOH}$

to produce aqueous sodium sulfate

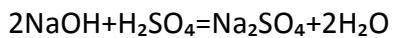
$\text{Na}_2\text{SO}_4$

and liquid water

$\text{H}_2\text{O}$

. Suppose 8.8 g of sulfuric acid is mixed with 5.40 g of sodium hydroxide. Calculate the maximum mass of water that could be produced by the chemical reaction. Be sure your answer has the correct number of significant digits.

### Answer



2Mol NaOH responds with 1mol  $\text{H}_2\text{SO}_4$

$$V\text{NaOH} = m/M = 5.4\text{g}/40\text{g/Mol} = 0.135\text{Mol}$$

$$V\text{H}_2\text{SO}_4 = m/M = 8.8\text{g}/98\text{g/Mol} = 0.0898\text{Mol}$$

NaOH a lack of

$$2\text{Mol NaOH} / 0.135\text{Mol NaOH} = 2\text{Mol H}_2\text{O} / X\text{mol H}_2\text{O}$$

$$V\text{H}_2\text{O} = 0.135\text{Mol}$$

$$m(\text{H}_2\text{O}) = V \cdot M = 0.135\text{Mol} \cdot 18\text{g/Mol} = 2.43\text{g}$$

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