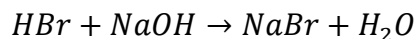


Answer on the Question #67249, Chemistry / General chemistry

Suppose 49.4 g of hydrobromic acid is mixed with 30. g of sodium hydroxide. What is the maximum mass of sodium bromide that could be produced by the chemical reaction?

Solution:



The mole number of each component of following chemical reaction:

$$n(HBr) = \frac{m(HBr)}{M(HBr)} = \frac{49.4 \text{ g}}{81 \frac{\text{g}}{\text{mol}}} = 0.61 \text{ mole}$$

$$n(NaOH) = \frac{m(NaOH)}{M(NaOH)} = \frac{30 \text{ g}}{40 \frac{\text{g}}{\text{mol}}} = 0.75 \text{ mole}$$

The number of moles of HBr less than mole number of NaOH, it means that NaOH is in excess and HBr is limiting reactant. Calculation of the mass of NaBr is performed by HBr.

$$n(HBr) = n(NaBr) = 0.61 \text{ mole}$$

$$m(NaBr) = n(NaBr) \cdot M(NaBr) = 0.61 \text{ mole} \cdot 103 \frac{\text{g}}{\text{mole}} = 62.8 \text{ g}$$

Answer: the mass of sodium bromide is 62.8 g.