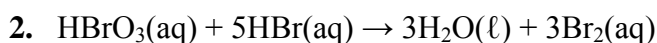# Percentage Yield Problems Answer Key

1. $\text{Percentage yield} = \dfrac{\text{Experimental yield}}{\text{Predicted yield}} \times 100\%$

   $\%\ \text{yield} = \dfrac{1.72\,\text{g}}{9.10\,\text{g}} \times 100\%$
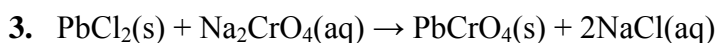
   $\%\ \text{yield} = 18.9\%$

2. $HBrO_3(aq) + 5HBr(aq) \rightarrow 3H_2O(\ell) + 3Br_2(aq)$

   (a) $20.0\,\text{g}\ HBrO_3 \times \dfrac{\text{mol}}{128.91\text{g}} \times \dfrac{3\,\text{mol}\ Br_2}{1\,\text{mol}\ HBrO_3} \times 159.80\dfrac{\text{g}}{\text{mol}}\ Br_2 = 74.4\,\text{g}\ Br_2$

   The predicted yield of Br_2 is 74.4 g.

   (b) $\text{Percentage yield} = \dfrac{\text{Experimental yield}}{\text{Predicted yield}} \times 100\%$

   $\%\ \text{yield} = \dfrac{47.3\,\text{g}}{74.4\,\text{g}} \times 100\%$

   $\%\ \text{yield} = 63.6\%$

3. $PbCl_2(s) + Na_2CrO_4(aq) \rightarrow PbCrO_4(s) + 2NaCl(aq)$

   (a) $12.5\,\text{g}\ PbCl_2 \times \dfrac{\text{mol}}{278.10\,\text{g}} \times \dfrac{1\,\text{mol}\ PbCrO_4}{1\,\text{mol}\ PbCl_2} \times 323.20\dfrac{\text{g}}{\text{mol}}\ PbCrO_4 = 14.5\,\text{g}\ PbCrO_4$
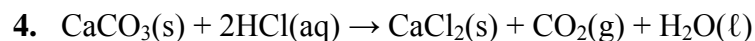
   The predicted yield of lead(II) chromate is 14.5 g.

   (b) $\text{Percentage yield} = \dfrac{\text{Experimental yield}}{\text{Predicted yield}} \times 100\%$

   $\%\ \text{yield} = \dfrac{13.8\,\text{g}}{14.5\,\text{g}} \times 100\%$

   $\%\ \text{yield} = 95.2\%$

4. $CaCO_3(s) + 2HCl(aq) \rightarrow CaCl_2(s) + CO_2(g) + H_2O(\ell)$

$$15.7\,g\ CaCO_3 \times \frac{mol}{100.09\,g} \times \frac{1\,mol\ CO_2}{1\,mol\ CaCO_3} \times 44.01\frac{g}{mol}\,CO_2 = 6.90\,g\ CO_2$$

The expected yield of carbon dioxide is 6.90 g.

$$Percentage\ yield = \frac{Experimental\ yield}{Predicted\ yield} \times 100\%$$

$$Experimental\ yield = \frac{(Percentage\ yield)(Predicted\ yield)}{100\%}$$

$$Experimental\ yield = \frac{(6.90\,g)(81.5\%)}{100\%}$$

$$Experimental\ yield = 5.62\,g\ CO_2(g)$$