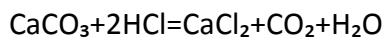


Answer on Question #65477, Chemistry / General Chemistry

When calcium carbonate is added to hydrochloric acid, calcium chloride, carbon dioxide, and water are produced. How many grams of calcium chloride will be produced when 27.0g of calcium carbonate are combined with 15.0 g of hydrochloric acid? Which reactant is in excess and how many grams of this reactant will remain after the reaction is complete?

Answer



1MolCaCO₃ responds with 2Mol HCl

$$V\text{CaCO}_3 = m/M = 27.0\text{g}/100\text{g}/\text{Mol} = 0.27\text{Mol total}$$

$$V\text{HCl} = m/M = 15.0\text{g}/36.5\text{g}/\text{Mol} = 0.41\text{Mol}$$

CaCO₃ in excess

$$V_1\text{CaCO}_3 = 0.205\text{Mol react}$$

$$V_2\text{CaCO}_3 = 0.27 - 0.205 = 0.065\text{Mol left}$$

$$m\text{CaCO}_3 = V * M = 0.065\text{Mol} * 100\text{g}/\text{Mol} = 6.5\text{g left}$$

$$2\text{MolHCl}/0.41\text{MolHCl} = 1\text{MolCaCl}_2/x\text{MolCaCl}_2$$

$$V(\text{CaCl}_2) = 0.205\text{Mol}$$

$$m\text{CaCl}_2 = V * M = 0.205\text{Mol} * 111\text{g}/\text{Mol} = 22.755\text{g about } 22.8\text{g}$$

Answer provided by <https://www.AssignmentExpert.com>