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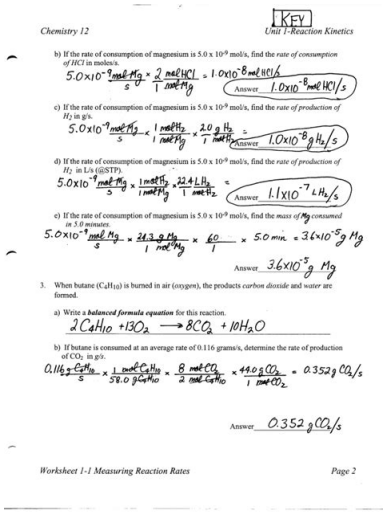

Chemistry 12 — KEY — Unit 1-Reaction Kinetics

b) If the rate of consumption of magnesium is 5.0 x 10^{-9} mol/s, find the *rate of consumption of HCl* in moles/s.

$5.0\times10^{-9}\ \frac{mol\ Mg}{s} \times \frac{2\ mol\ HCl}{1\ mol\ Mg} = 1.0\times10^{-8}\ mol\ HCl/s$

Answer 1.0x10^{-8} mol HCl/s

c) If the rate of consumption of magnesium is 5.0 x 10^{-9} mol/s, find the *rate of production of* H_2 in g/s.

$5.0\times10^{-9}\ \frac{mol\ Mg}{s} \times \frac{1\ mol\ H_2}{1\ mol\ Mg} \times \frac{2.0\ g\ H_2}{1\ mol\ H_2} =$

Answer 1.0x10^{-8} g H_2/s

d) If the rate of consumption of magnesium is 5.0 x 10^{-9} mol/s, find the *rate of production of* H_2 in L/s (@STP).

$5.0\times10^{-9}\ \frac{mol\ Mg}{s} \times \frac{1\ mol\ H_2}{1\ mol\ Mg} \times \frac{22.4\ L\ H_2}{1\ mol\ H_2} =$

Answer 1.1x10^{-7} L H_2/s

e) If the rate of consumption of magnesium is 5.0 x 10^{-9} mol/s, find the *mass of Mg consumed in 5.0 minutes*.

$5.0\times10^{-9}\ \frac{mol\ Mg}{s} \times \frac{24.3\ g\ Mg}{1\ mol\ Mg} \times \frac{60}{1} \times 5.0\ min = 3.6\times10^{-5}\ g\ Mg$

Answer 3.6x10^{-5} g Mg

3. When butane (C_4H_{10}) is burned in air (oxygen), the products *carbon dioxide* and *water* are formed.

a) Write a ***balanced formula equation*** for this reaction.

$2\ C_4H_{10} + 13O_2 \longrightarrow 8CO_2 + 10H_2O$

b) If butane is consumed at an average rate of 0.116 grams/s, determine the rate of production of CO_2 in g/s.

$\frac{0.116\ g\ C_4H_{10}}{s} \times \frac{1\ mol\ C_4H_{10}}{58.0\ g\ C_4H_{10}} \times \frac{8\ mol\ CO_2}{2\ mol\ C_4H_{10}} \times \frac{44.0\ g\ CO_2}{1\ mol\ CO_2} = 0.352\ g\ CO_2/s$

Answer 0.352 g CO_2/s

Worksheet 1-1 Measuring Reaction Rates — Page 2

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Chemistry Stoichiometry Problem Sheet 2 Key