**Answers to Chapter 6 #1-6 pg 357, #1-10 pg 360-361**

**#1-6 pg 357**

1. 1. Measure the change in mass of the reactant, limestone, over a period of time or the volume of product, CO2(g), generated over a period of time.
2. A balanced chemical equation does not give information about the rate at which the chemical reaction occurs.
3. Since the concentration increased from 0.25 mol/L to 0.420 mol/L over time, a product was measured.
4. The graph should show that the tangent is a line drawn so it just touches the curve at one point. The instantaneous rate at the point where the tangent touches the curve is calculated by measuring the slope of the tangent. This is done by determining the rise and the run of the line and dividing the rise by the run. The rise is the change in concentration and the run is the change in time.
5. a. Molecules of A that remain = 30; molecules of B that remain = 10

b. The average rate of reaction can be determined using the number of molecules of A that are consumed or the number of molecules of B that are produced over a period of time.

∆A / ∆t = 30 molecules − 40 molecules / 10 s − 0 s = = -1 molecule/s

∆B / ∆t = 10 molecules − 0 molecules / 10 s − 0 s = = +1 molecule/s

c. The average rate of change in the number of molecules of A and of B is the equal but opposite.

1. The manager would be concerned about the average rate of spoilage. It represents how long the fruit could be left on the shelf. The instantaneous rate indicates only how fast the fruit was spoiling at one point in time.

**#1-10 pg 360-361**

1. The average rate of consumption of B is -4.74 × 10-5 mol/L·s.
2. -7.0 × 10-4 mol/L·s
3. a. 0.165 mol

b. 0.165 mol Br2(aq)

1. 1.4 mol/L
2. 5.0 × 10-4 L/s
3. rate of formation of BrO3-(aq) = 0.060 mol/L·s; rate of consumption of BrO-(aq) = 0.18 mol/L·s
4. a. The average rate of consumption of HBr(g) over 50.0 s is 0.0032 mol/L·s.

b. 0.080 mol/L

1. 1.40 × 102 mol/L
2. a. 2.42 × 10-4 mol/s

b. 2.98 × 10-3 L/s

1. 0.70 mol/L·s Cl2(g) consumption; NOCl(g) is produced at a rate of 1.4 mol/L·s