Rates of reaction

- Read 18.1 pg. 737-738
- Demonstration of variations in reaction rates:
  Ca vs. Na vs. Li in water to produce H_2 gas
  Flour burning in air
  $8H^+ + C_2O_4^{2-} + \mathbf{MnO_4^-} \rightarrow Mn^{2+} + 4H_2O + CO_2$
  H_2SO_4, $H_2C_2O_4$ (oxalic), $\mathbf{KMnO_4}$ provide ions
- From the list predict the fastest (1) to slowest (4)

	0.5 M oxalic acid	1.0 M H_2SO_4	water	Other
a	2.5 mL	2.5 mL	5.0 mL	
b	2.5 mL	2.5 mL	5.0 mL	at 60°C
c	2.5 mL	2.5 mL	5.0 mL	+ manganous sulfate
d	2.5 mL	5.0 mL	2.5 mL	

Examples of factors affecting rate

- Read 18.2. For each of the 5 factors give one example from today's demonstrations
- Nature of reactants –
- Ability of the reactants to meet –
- The concentration of the reactants –
- The temperature of the system –
- The presence of catalysts –

Measuring Reaction Rates

Read 18.3 (740 – 42). Answer these questions:

1. What units are associated with concentration?
2. What units are associated with reaction rate?
3. What do the square brackets in [HI] indicate (see figure 18.2, pg. 741)
4. Expalin how the rate of a reaction is determined (see fig. 18.2)?
5. Plot this data (include title, axes labels):

[HI]	0.100	0.072	0.056	0.046	0.039	0.034	0.030	0.026
Time (s)	0	50	100	150	200	250	300	350

Measuring Reaction Rates

6. For the data, determine the rate of reaction at i) 25 s, ii) 175 s, and iii) 325 s. Show your work and calculations on the graph.
7. How does the rate at the beginning of a reaction compare to the rate later in a reaction? Explain why this makes sense according to one of the 5 factors that affect reaction rates (from 18.2)?
8. Explain how the rate of reaction of $2HI \rightarrow H_2 + I_2$ is determined experimentally.
9. Do PE 2 (pg. 742)