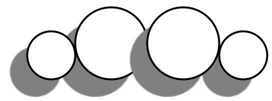
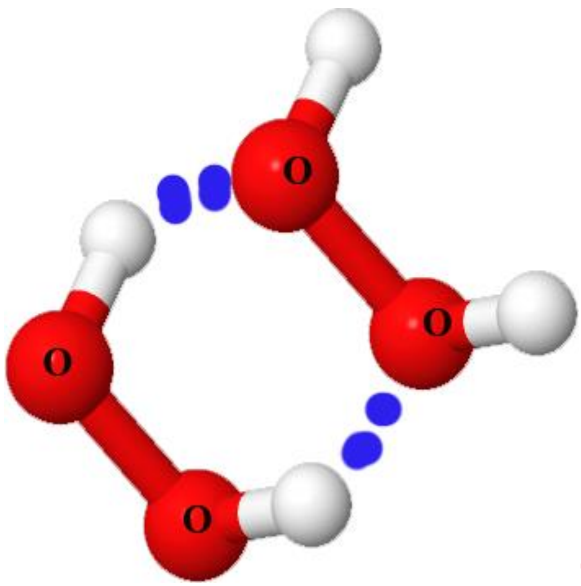
Chemistry Pretest 1.3

1. a) Draw two H_2O_2 molecules. Label all *intermolecular* and *intramolecular* bonds. How many intramolecular bonds are there for each molecule?





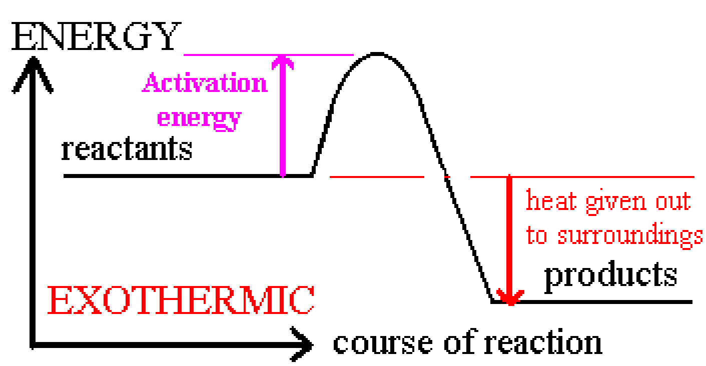
The blue dots represent intermolecular bonds.
There are 3 intramolecular bonds for each molecule.

b) What kind of bond is formed when straightened-out egg protein molecules turn white during cooking?

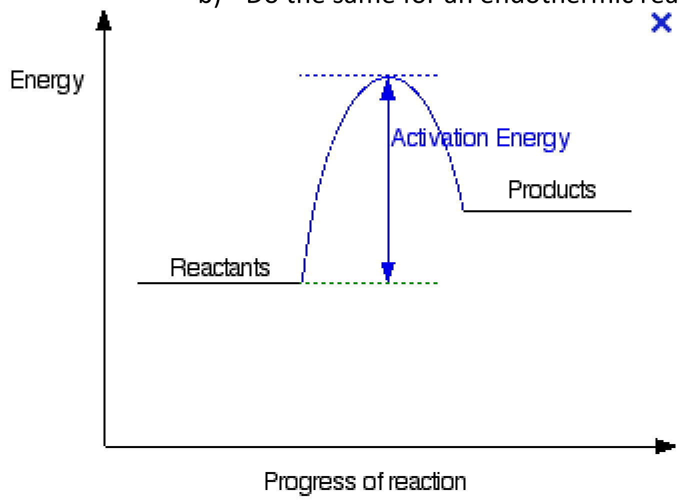
intermolecular bonds

"What kind of Bond" does not refer to the different Bond actors that've played the role.

2. a) Draw a reaction profile for an exothermic reaction.



b) Do the same for an endothermic reaction.



3. Classify as endothermic or exothermic.

a) If a yellow straw turns blue when placed in ice but reverts to yellow when placed in warm water, then yellow → blue is __exothermic___

b) A reaction where $\Delta H_{bb} > \Delta H_{BF}$___ endothermic ___ NOT ON TEST --- have not done that yet

c) A reaction with kJ among the reactants____ endothermic __

d) The electrolysis of water : $2H_2O \rightarrow 2H_2 + O_2$__ endothermic ___

e) The condensation of alcohol on a cold glass____ exothermic ___________

f) A reaction in which ΔH = (-)___exothermic ____

4. What is the partial pressure of CO_2 if its concentration in a 100.0 kPa atmosphere is 396 ppm ? Few people realize that when ppm is expressed for gases, it's not mg/L, as it is for aqueous solutions. Instead it's *a mole fraction*: $\frac{n_A}{n_T}$

The reason for this is that although there are a million mg of water in a 1 L of ***liquid*** water, 1 L of air does not weigh 1 million mg. So for air 396 ppm = **396 moles of CO2 per 1 000 000 moles of air**

396 ppm (or 396 parts per million) for a gas mixture is 396 moles of CO2 per 1 000 000 moles of dry air. We could use that as the mole fraction for the formula

$$P_A = \left(\frac{n_A}{n_T}\right) P_T$$

$P_A = \left(\frac{396\ moles}{\mathbf{1\ 000\ 000}\ \ moles}\right) 100.0kPa =$ 0.0396 kPa

b) How many grams of CO_2 would there be in 2.0 L of air with a 396 ppm CO_2 concentration at 30.0 C?

From previous answer $PCO2 = \left(\frac{396\ moles}{\mathbf{1\ 000\ 000}\ \ moles}\right) 100.0kPa =$ 0.0396 kPa

$P_{CO2}V = n_{CO2}RT$

0.0396 kPa(2.0 L) = $n_{CO2} \frac{8.31\ L\ kPa}{K\ mole}$ (30.0 + 273 K)

n_{CO2} =

.00003145440898 mole

0.000032527 moles (44.0 g/mole) = 0.0014 g of carbon dioxide

<u>NO Flashback on this mini theory/ lab pretest.</u>