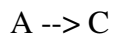
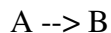


## Kinetics Problem Set 2 – Solutions

Question 1: Consider the following parallel reaction with



with  $k_1$  and  $E_{a_1}$  for the first reaction and  $k_2$  and  $E_{a_2}$  for the second. The ratio of the rate constants is

$$k_1/k_2 = (A_1 * \exp\{-E_{a_1}/RT\})/(A_2 * \exp\{-E_{a_2}/RT\}).$$

Using  $k_1/k_2 = 1$  and the given values of the activation energies – one can solve for  $A_1/A_2$ . To complete the problem,

$$k_1/k_2 = 2 = (A_1/A_2) \exp\{(E_{a_2} - E_{a_1})/RT\}$$

where  $A_1/A_2$  is now known, and  $(E_{a_2} - E_{a_1})$  is also known. So solve for  $T$ !

Questions 2-5: See the solutions in the second part of the solutions. Note the question numbers are off by 1 (question 1 in solution corresponds to question 2 in problem set).