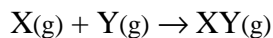
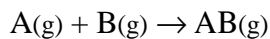
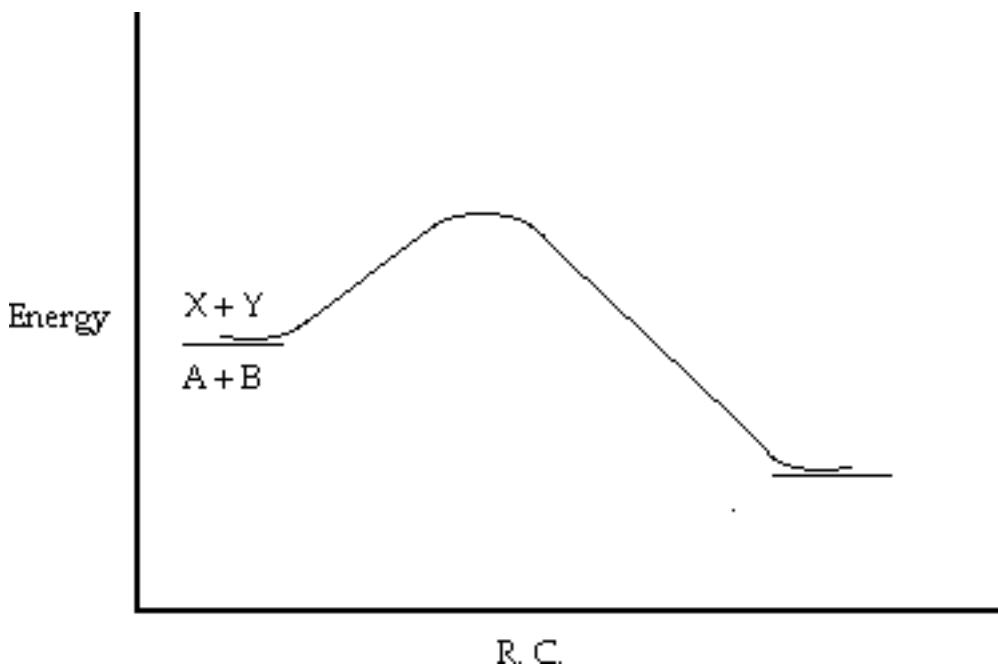


ALL work must be shown to receive full credit. **Due at the beginning of lecture on Friday, October 19, 2001.**

PS9.1.



Two reactions are represent above. The potential energy diagram for the first reaction is shown below. The energy of the reactants for the second reaction is the same as the energy of the reactants for the first equation. The reaction between X and Y is endothermic and the activation energy for the reaction is higher than that of the reaction between A and B.

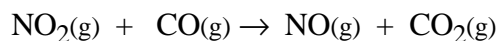


- Complete the potential energy diagram for the reaction between X and Y in the diagram above. (6)
- How is the rate of the reaction between A and B affected as the temperature is increased by 20 °C? Explain the basis of your prediction. (5)

PS9.1. (CONTINUED)

- c) Write the general rate law for the reaction between X and Y. Write an expression for the rate of the reaction in terms of one of the reactants. (6)
- d) Briefly describe an experiment(s) that can be conducted to determine the order of the reaction for X and for Y. (8)
- e) From the information given, which reaction initially proceeds at the faster rate under the same conditions of concentration and temperature. Justify your answer(6)

PS9.2. The rate law for the reaction;



is rate = $k[\text{NO}_2]^2$. Suggest a mechanism for the reaction.