Endothermic and Exothermic Activity

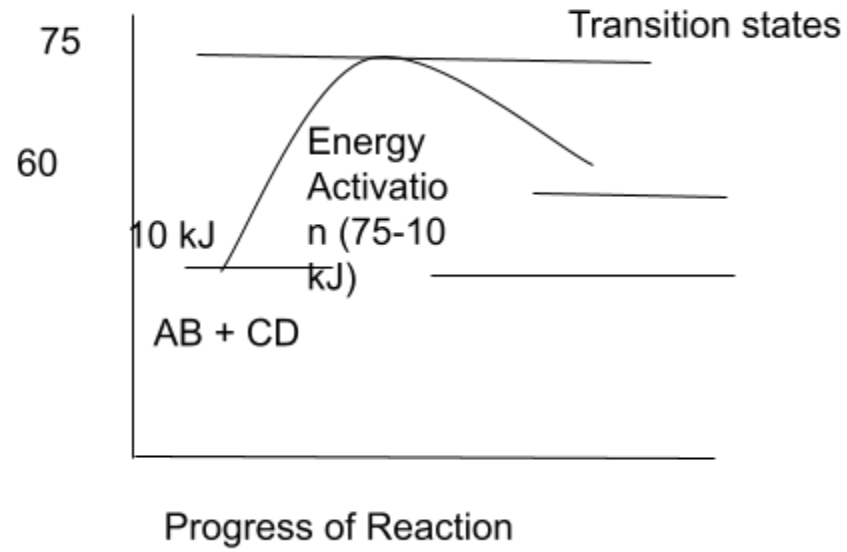
For this assignment, you will create your own potential energy diagrams for each of the three chemical reactions. Then you will analyze the data and your diagrams for each reaction.

Generic Reactions	**Reactants**		**Products**		**Transition State**
Synthesis $A + B \rightarrow AB$	A + B	−15 kJ	AB	20 kJ	30 kJ
Single Replacement $C + AB \rightarrow CB + A$	C + AB	65 kJ	CB + A	30 kJ	85 kJ
Double Replacement $AB + CD \rightarrow AD + BC$	AB + CD	10 kJ	AD + BC	60 kJ	75 kJ

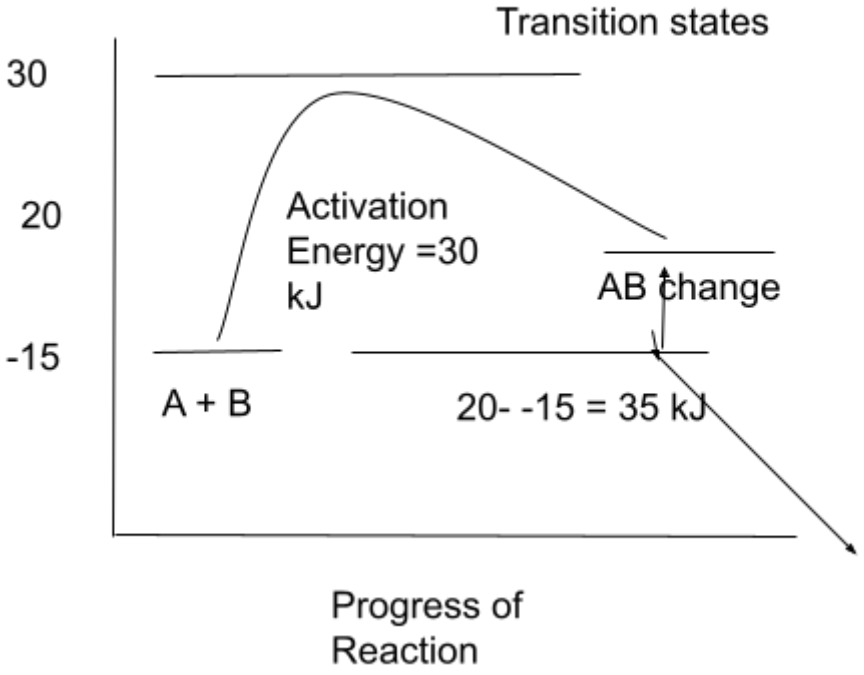
To assist you, use the enthalpy values in the data chart for each generic reaction provided. Be sure to following the summary of steps below.

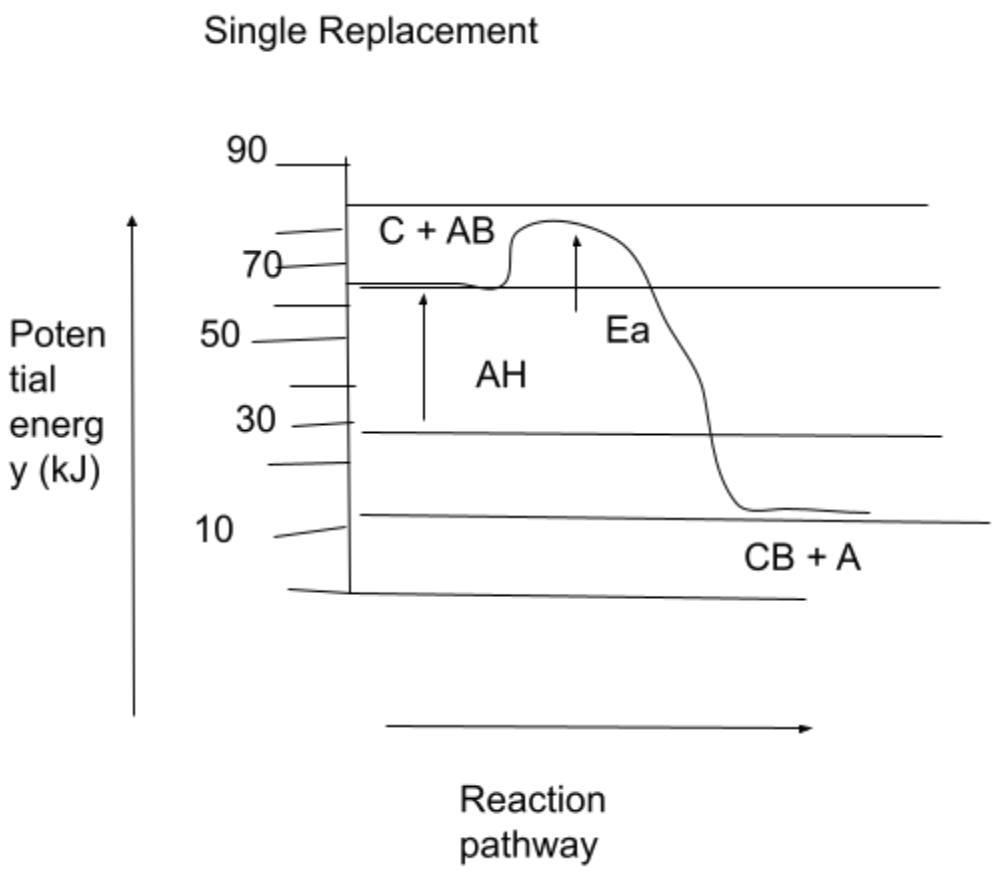
- Illustrate the x- and y-axes to show the reaction pathway and potential energy, in kilojoules. Ensure your energy intervals are appropriate for the data.
- Plot the enthalpy values of the reactants, products, and transition state using three horizontal dotted lines across the graph for each.
- Draw the energy curve from the reactants line to the transition state and curve the line back down to the energy of the products. Label the reactants, products, and transition state.
- Illustrate double-headed arrows to represent both the total change in enthalpy (ΔH) and the activation energy (E_a).
- Calculate the total change in enthalpy and the activation energy using the energy values provided for each reaction. Record those values below the graph.
- Make sure correct units are included.

Double Replacement Reaction



Synthesis Reaction





Conclusion Statement

Write a two to four sentence conclusion statement explaining how the potential energy diagram is used to identify if the reaction is endothermic or exothermic, if heat was released or absorbed, and why the sign of enthalpy change was positive of negative. There should be a conclusion statement for each graph.

The potential energy diagram shows a positive q which can indicate the endothermic reaction. Heat has been absorbed because the products were at a higher potential energy than the reactants. AH= +35 kJ because of the reaction absorbing the energy.