

Name: \_\_\_\_\_ Pd: \_\_\_\_\_ Date: \_\_\_\_\_

**Lab # \_\_\_\_\_ Constructing Potential Energy Curves**

Aim: To construct a potential energy curve for an endothermic reaction and a potential energy curve for an exothermic reaction.

Define (cite source): (12 points)

Potential Energy:

Heat of Reaction:

Activation Energy:

Activated Complex:

Forward Reaction:

Reverse Reaction:

Materials:

Graph paper

Pencil

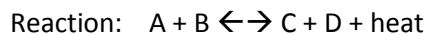
Ruler

Data from lab worksheet

Method:

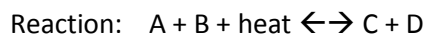
Use the following data to create two Potential energy curves. Once constructed, label each curve as instructed following the data tables. (Each graph is worth 24 points – 5 points for proper set up (title, axis properly labeled); 5 points for neatness; 14 points for labeled elements)

GRAPH A:



Potential Energy of the Reactants	Potential Energy of the Products	Activation Energy
45kJ	25kJ	10kJ

GRAPH B:



Potential Energy of the Reactants	Potential Energy of the Products	Activation Energy
35kJ	50kJ	35kJ

On your graphs, label the following:

1. Potential Energy of the Reactants for the forward reaction.
2. Potential Energy of the Products of the forward reaction.
3. Activation Energy of the forward reaction.
4. Potential Energy of the Activated Complex
5. Heat of reaction
6. Identify/label the forward reaction as endothermic or exothermic.
7. On Graph A, show the effect of a catalyst on the reaction coordinates.
8. On Graph B, label the Potential Energy of the Reactants for the reverse reaction.

Answer the following questions based on the chemical reactions given for Graph A and Graph B (5 points each):

1. What are the two requirements of an effective collision?
2. List 5 factors that affect reaction rate.
3. What in the reaction equation tells you these reactions can be reversed?
4. What in the reaction equation tells you whether the reaction is endothermic or exothermic?

Answer the following from your graph: (5 points each)

1. What on the PE diagram indicates whether the reaction is endothermic or exothermic?
2.
  - a. How does the addition of a catalyst to the reaction change the PE diagram?
  - b. What is the effect of a catalyst on the Activation Energy of both the forward and reverse reactions?
  - c. What is the effect of a catalyst on the Heat of Reaction?

Regents Questions (2 points each)