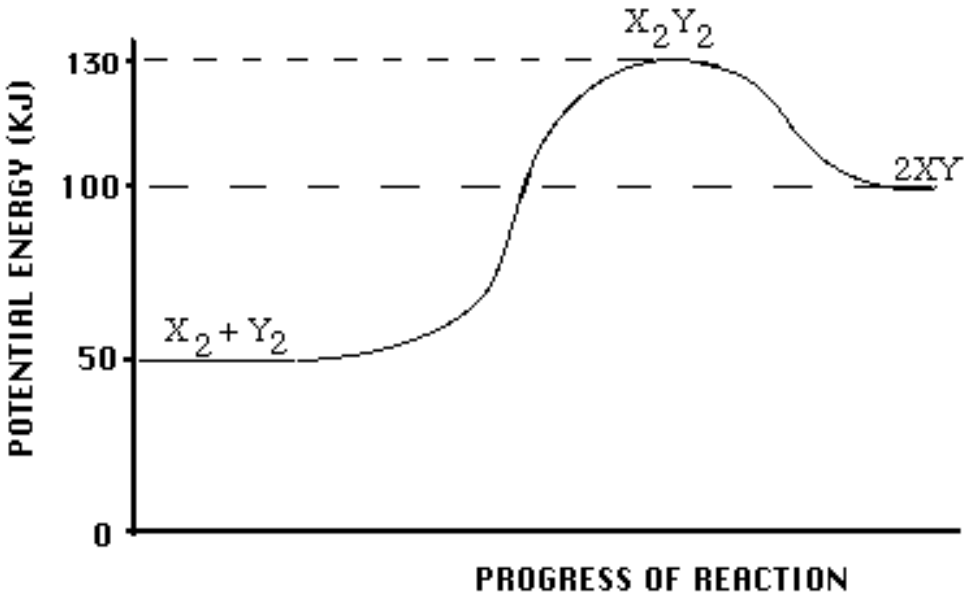
# Chemistry 12
# Worksheet 1-2 - Potential Energy Diagrams

USE THE **POTENTIAL ENERGY DIAGRAM** TO ANSWER THE QUESTIONS BELOW:




1. Is the overall reaction as shown **exothermic** or **endothermic**?

   _____

2. What is the **activation energy** for the forward reaction?

   _____

3. What is the **activation energy** for the reverse reaction?

   _____

4. What is the **enthalpy change of reaction** ( H) for the *forward* reaction?

   _____

5. What is the **H** for the *reverse* reaction?

   _____

6. Is the ***reverse*** reaction **exothermic** or **endothermic**? _____

7. Which species forms the ***activated complex***? _____

8. Which species or set of species has the *highest* **potential energy**?

   _____

9. Which species or set of species has the *highest* **kinetic energy**?

_____

10. Which species or set of species has the ***weakest*** **bonds**?

_____

11. Which species or set of species has the ***strongest*** **bonds**?

_____

12. What is **H** for the reaction: $\mathbf{X_2Y_2 \rightarrow X_2 + Y_2}$ ?

_____

13. Which do you think would be *faster*, the **forward** reaction or the **reverse** reaction?

_____ Explain. _____

_____

14. Which species or set of species has the ***lowest*** **kinetic energy**?

_____

15. Show the **ΔH**, the Activation Energy for the *forward* reaction and the Activation Energy for the *reverse* reaction on the graph above.

16. As reactant particles approach each other before a collision, the ***Potential*** Energy goes ___, while the ***Kinetic*** Energy goes _____.

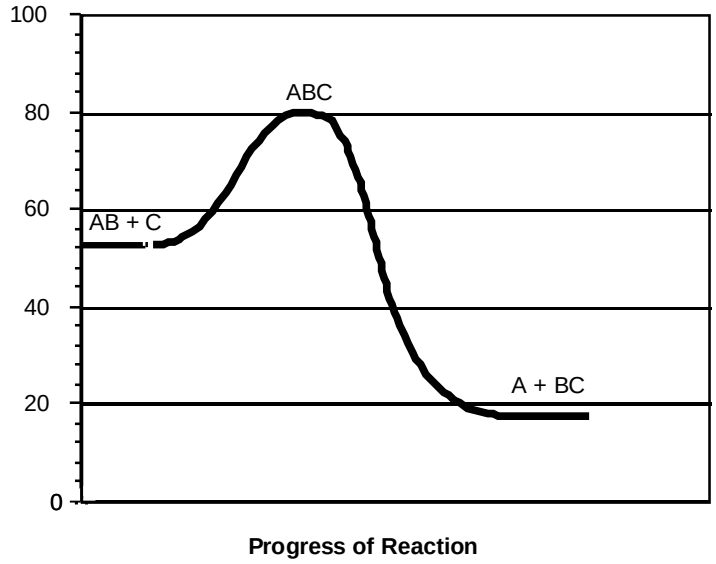
17. As particles of newly formed products move away from one another, the ***Potential*** Energy goes _____, while the ***Kinetic*** Energy goes _____

18. As *reactant* molecules approach each other, they exert _____ forces on each other. Thus, as they move together, their speed _____ and their *Potential Energy* _____

19. State the meaning of ***Activated Complex***. _____

_____

20. Use the following ***Potential Energy Diagram*** to answer the questions below:




a) Determine the ***Activation Energy*** for the *forward* reaction... _____kJ

b) Determine the ***Activation Energy*** for the *reverse* reaction.... _____kJ

c) What is the ***Enthalpy Change*** (ΔH) for the *forward* reaction?.. _____kJ

d) What is the ***Enthalpy Change*** (ΔH) for the *reverse* reaction?.. _____kJ

e) The *forward* reaction is _____thermic.

f) The *reverse* reaction is _____thermic.

g) Which species or set of species forms the ***Activated Complex***? _____

h) Which bond is *stronger*, A--B or B--C?_____. Give a reason for your answer. _____

_____

i) Particles from which species or set of species is moving the *fastest*? _____

State how you arrived at your answer. _____

_____

j) Particles from which species or set of species is moving *most slowly*? _____

State how you arrived at your answer. _____

_____

k) The compound "AB" is a gas and the element "C" is a solid. What effect would grinding"C" into a fine powder have on the graph shown here? _____

_____

21. State the meaning of ***Activation Energy***. _____

_____

_____

22. What two requirements must be met before a collision between two reactant particles is ***effective***?

1. _____

2. _____

23. Describe what happens to two reactant particles which collide with *less* energy than the ***Activation Energy***.

_____

_____

24. Burning coal (Carbon) is a highly *exothermic* reaction. However coal, in contact with air at room temperature has such a *slow* reaction that it is not noticeable. Explain these two facts with the help of a Potential Energy Diagram.