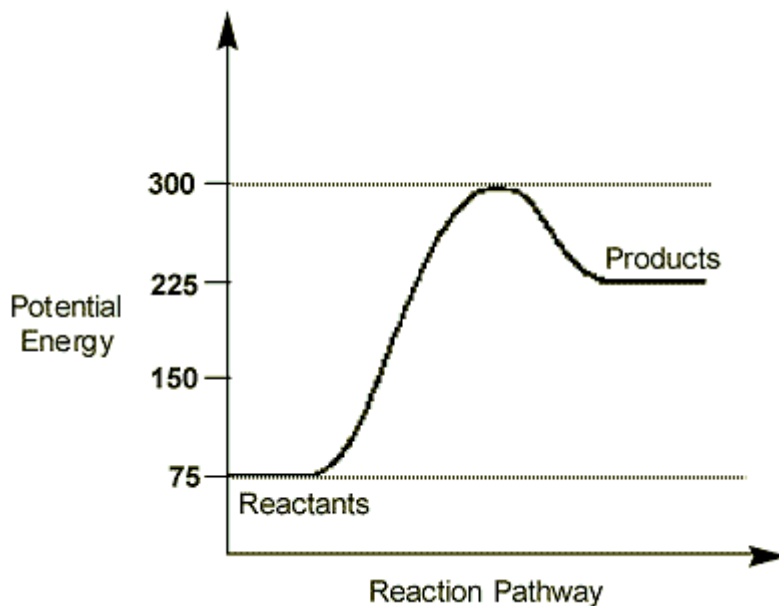


Practice Celebration for Kinetics & Equilibrium Use the diagram at right for questions 1-8.

1. What is the correct unit for the Y axis of this graph? **kJ/mole**
2. What is the  $\Delta H$ ?  **$225 - 75 = 150$  kJ/mole**
3. What is the activation energy of this reaction?  **$300 - 75 = 225$  kJ/mole**
4. What is the activation energy with a catalyst? **Less than 225 kJ/mole**
5. What is the potential energy of the reactants? **75 J/mole**
6. Is this an exothermic or endothermic reaction? **Endo,  $\Delta H$  is +**
7. What is the potential energy of the products? **225 kJ/mole**

8. State a reason for your answer in #7 in a complete sentence starting with:  
This reaction is **endothermic** because... **the products have more potential than the reactants started with, they absorbed this energy.**



9. Define entropy: **the measurement of disorder in a system**
10. Which has the MOST entropy? circle one:  $\text{HCl}_{(s)}$   $\text{HCl}_{(aq)}$   **$\text{HCl}_{(g)}$**   $\text{H}_2\text{O}_{(l)}$
11. Which as the LEAST entropy? circle one: water vapor liquid water **ice**
12. Put the three phases of matter in this equation in regard to entropy:

**gas (most) > liquid water > ice (least)**

13. Skip

In this reaction:  $\text{HCl}_{(\text{AQ})} + \text{NaOH}_{(\text{AQ})} \rightleftharpoons \text{NaCl}_{(\text{AQ})} + \text{HOH}_{(\text{L})} + \text{E}$

14. Is the forward reaction endothermic? **No, energy is a product**

15. Is the reverse reaction endothermic? **Yes, energy is a product**

In this reaction:  $\text{N}_{2(\text{G})} + 3\text{H}_{2(\text{AQ})} \rightleftharpoons 2\text{NH}_{3(\text{AQ})}$

16. Does the forward reaction lead to more or less entropy? **Less (no gases)**

17. What is the  $\Delta\text{H}$  of this reaction? **-91.8 kJ/mole**

18. As the pressure is decreased on this equilibrium, do you get more or less nitrogen? **More**

19. As the pressure is increased, do you get more or less hydrogen? **Less**

20. As the temperature increases, do you get more or less ammonia? **Less**

21. A reaction you time takes 11.5 seconds exactly to complete. The reaction rate is:

A. 11.5 seconds    **B. 1/11.5 seconds**    C. 11.5/1 seconds    D.  $11.5^{-2}$  seconds

22. As concentration of reactants is increased, what should happen to the rate of reaction?

**Increase the rate of reaction**

23. Explain why: The rate of reaction would increase as the reactant concentration

increases. **Faster particles, more collisions, faster reaction.**

24. As the temperature decreases, the rate of reaction will **decrease** because

**lower temp means lower kinetic energy, slower particles, less collisions.**