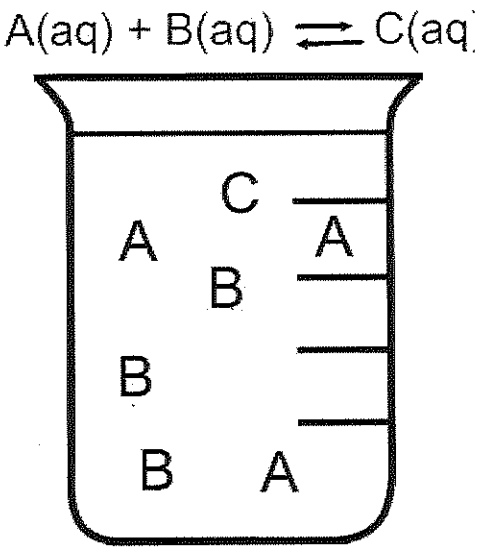
(#11-3)

Where am I and where am I going?



1. The beaker below is an equilibrium expression. Answer the following questions. Reaction is being run at 25C.
   a. Write the equilibrium expression for this reaction.

      $K_c = \frac{[C]}{[A][B]}$

   b. Is the K value for this substance bigger or smaller than 1?

      Reactant favored <1

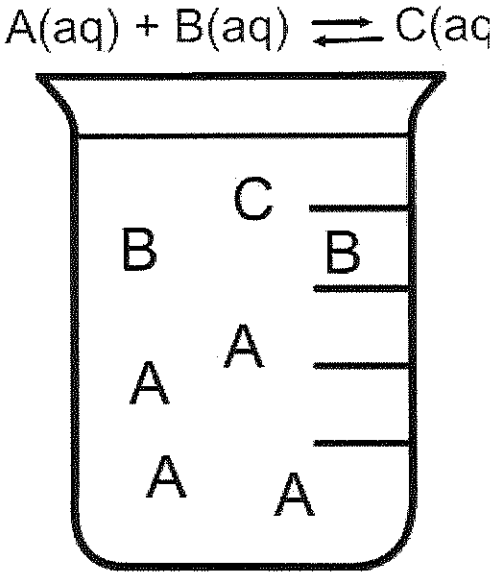
   c. Would you consider this reaction (product favored/reactant favored)

   d. Each letter will represent 0.1M, what is the value of K?

      $K = \frac{.1}{.1 \cdot .1} = 10$ ← Notice Not less than 1, Algorithm and Value Cause variation

   e. What is the only way to change the equilibrium constant?

      alter temp



2. To the right is another beaker with the *same reaction as above* at 25C.
   a. What is the K for this reaction?

      10

   b. Each letter represents a 0.1M concentration, Determine the reaction quotient or this reaction.

      $Q = \frac{.1}{.4 \cdot .2} = 1.25$

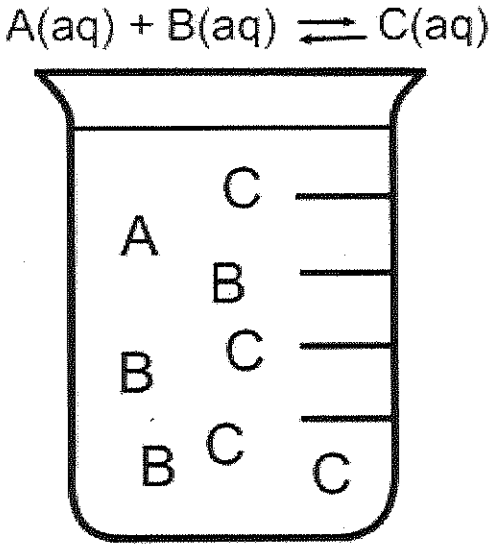
   c. Is this reaction
      i. At equilibrium? NO
      ii. Too much reactant? ←
      iii. Too much product? NO

      Q<K → P/R

   d. Given time all reactions will achieve equilibrium. To achieve equilibrium this reaction will
      i. Stay where it is.
      ii. Loose product and gain reactant
      iii. Loose reactant and gain product.

5. Temp → Changes K

3. To the right is another beaker running the same reaction at the same temperature.



   a. What is the K value for this reaction?

      10

   b. What is the reaction quotient for the reaction to the right?
      (each letter represents 0.1M)

      $Q = \frac{.4}{.3 \cdot .1} = 13.3$

   c. Is this reaction
      i. At equilibrium? NO
      ii. Too much reactant? yes
      iii. Too much product? NO

      $Q > K$

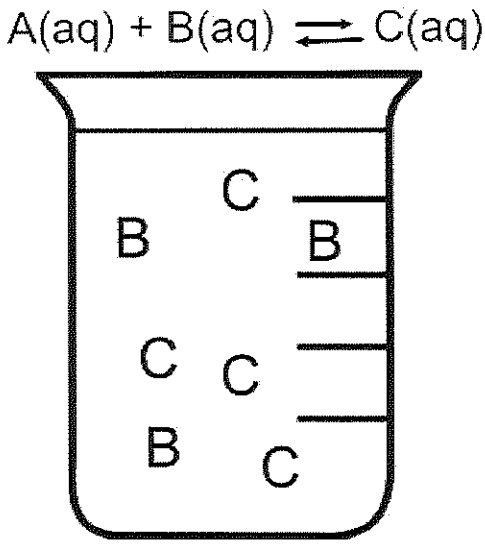
      P
      R ↓

   d. Given time all reactions will achieve equilibrium. To achieve equilibrium this reaction will
      i. Stay where it is.
      ii. Loose product and gain reactant
      iii. Loose reactant and gain product.

4. To the right is another beaker running the same reaction at the same temperature.

   a. What is the K value for this reaction?

      10



   b. What is the reaction quotient for the reaction to the right?
      (each letter represents 0.1M)

      $Q = \frac{.4}{13.0} = \infty$ large

   c. Is this reaction
      i. At equilibrium?
      ii. Too much reactant?
      iii. Too much product?

   d. Given time all reactions will achieve equilibrium. To achieve equilibrium this reaction will
      i. Stay where it is.
      ii. Loose product and gain reactant ←
      iii. Loose reactant and gain product.