

CALCULATING EQUILIBRIUM CONSTANTS

Name: _____

1. An aqueous solution of acetic acid is found to have the following equilibrium concentrations at 25°C: $[\text{HC}_2\text{H}_3\text{O}_2] = 1.65 \times 10^{-2}\text{M}$; $[\text{H}^+] = 5.44 \times 10^{-4}\text{M}$; and $[\text{C}_2\text{H}_3\text{O}_2^{-1}] = 5.44 \times 10^{-4}\text{M}$

Calculate the equilibrium constant K_c for the ionization of acetic acid at 25°C. The reaction is:



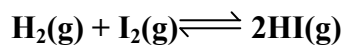
2. Sulfur trioxide decomposes at high temperature in a sealed container:



Initially, the vessel is charged at 1000K with $\text{SO}_3(\text{g})$ at a partial pressure of 0.500atm. At equilibrium the SO_3 partial pressure is 0.2000atm. Calculate the value of K_p at 1000K.

	2SO_3	\rightleftharpoons	2SO_2	O_2
I				
C				
E				

3. At 448°C the equilibrium constant K_c for the reaction



is 50.5. Predict in which direction the reaction will proceed to reach equilibrium at 448°C if we start with 2.0×10^{-2} mol of HI, 1.0×10^{-2} mol of H_2 , and 3.0×10^{-2} mol of I_2 in a 2.00L container.

4. A 1.000L flask is filled with 1.000mol of H_2 and 2.000mol of I_2 at 448°C. The value of the equilibrium constant K_c for the reaction is **50.5**.

What are the equilibrium concentrations of H_2 , I_2 and HI in moles per liter?

	H_2	I_2	\rightleftharpoons	2HI
I				
C				
E				