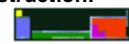


Revised August 2009



AP WORKSHEET 13a: ANSWERS



1. $4.55 \times 10^{-1} \text{ M}$
2. 2.52×10^5
3.
 - (a) Increasing the volume decreases the pressure so the equilibrium will shift to oppose the change and create more pressure by shifting to the product side where a greater number of moles of gas exist
 - (b) Increasing the concentration of products will cause the equilibrium to shift to oppose the change and use up the extra products by shifting to the reactant side
4. $\text{H}_2 = 0.005$ moles, $\text{I}_2 = 0.105$ moles, $\text{HI} = 0.19$ moles
5. $\text{Cl}_2 = 1.92$ moles, $\text{CO} = 0.12$ moles, $\text{COCl}_2 = 0.28$ moles
6.
 - (a) 0.593
 - (b)
 - (i) No change. A catalyst has no effect upon the equilibrium position, only the speed that it is achieved
 - (ii) Amount of ammonia is increased. Increasing the pressure means that the equilibrium will shift to oppose the change and create less pressure by shifting to the product side where a smaller number of moles of gas exist
 - (iii) Amount of ammonia is decreased. Increasing the temperature means that the equilibrium will shift to oppose the change and use the extra heat to promote the backward, endothermic reaction