AP Chemistry Daily Videos
7.9 Introduction to Le Châtelier's Principle

Video #1

1. Identify 5 ways a system can be stressed and what that does to the reaction.

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3:20

2. How can you tell by the graph that the system was at equilibrium?

3. Complete the table by drawing how a system will respond to the following stresses.

Stress	Response and Rationale	Picture Representation
Reactant is Increased		
Reactant is Decreased		
Removing Water (Increasing concentration)		
Adding Water (Dilution)		
Adding an Ion		

4. Fill out your response below. Compre your response to the instructor's and identify any ways you could improve.

Evaluate each stress to determine if it will will result in an increase or decrease in the concentration of chromate ion, CrO_4^{2-}, as equilibrium is re-established

$$Cr_2O_7^{2-}(aq) + 3H_2O \text{ (l)} \rightleftharpoons 2CrO_4^{2-}(aq) + 3H_3O^+(aq)$$
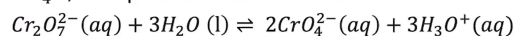
a) Addition of OH^- ion.
b) Concentrating the solution by allowing water to evaporate.

Claim	
Evidence	
Reasoning	

1.

Stress	Response and Rationale	Picture Representation
Pressure is increased		
Pressure is decreased		
Catalyst is added		
Adding a solid		

(II)
1:33

2. When evaluating how pressure changes a reaction with gas molecules, what caution did the instructor provide?

1. If a reaction is <u>exothermic</u> in the forward direction, then it is _____ in the reverse direction.

2.

Stress	Response and Rationale	Picture Representation
Temperature is added to an endothermic reaction		

3. Explain in words or pictures why K is larger for endothermic reactions that are heated.

(II)
3:34

4. Evaluate your response to the following question. Make sure you explained your choice.

$2\,CH_4(g) + O_2(g) \rightleftharpoons 2\,CH_3OH(g)$ $\Delta H° = -252\ kJ/mol_{rxn}$ $K_P = \dfrac{(P_{CH_3OH})^2}{(P_{CH_4})^2 (P_{O_2})}$

Does the equilibrium constant for the reaction shown increase or decrease when the temperature of a system at equilibrium is increased?

5. How did you do on the last few problems?