

AP LAB 07I: Le Châtelier's Principle Simulation II

Use the simulation at the following URL to answer the questions that follow; <https://bit.ly/2JkP9jn>

Listen to the audio that plays once the page has loaded. The audio lasts only approx. 30 seconds.

1. Click on the Change in Concentration button **and listen to the audio.**

Change in
Concentration

- (a) Why does the solution start out as an orange color?

2. Click on the Add NaSCN button **and listen to the audio.**

Add NaSCN

- (a) What property of NaSCN makes it a good source of $\text{SCN}^-_{(\text{aq})}$ when added to the beaker?

- (b) Which of the following will cause a similar shift to adding NaSCN?

- (i) adding KSCN
(ii) adding $\text{Fe}(\text{NO}_3)_3$
(iii) adding $[\text{FeSCN}]^{2+}_{(\text{aq})}$

3. Click on the Back button.

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4. Click on the Remove Fe^{3+} button **and listen to the audio.**

Remove Fe^{3+}

- (a) Assuming that addition of aqueous oxalate ions ($\text{C}_2\text{O}_4^{2-}$) to the equilibrium mixture produces the aqueous trioxalatoferrate(III) ion, $[\text{Fe}(\text{C}_2\text{O}_4)_3]^{3-}$, write an equation to show its formation.

5. Click on the Back button.

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6. Click on the Change in Pressure button **and listen to the audio**.

Change in
Pressure

- (a) What happens to the entropy of the equilibrium system as the reaction goes from left to right?
- (b) What is the name of the gas law that relates pressure and volume? Write a mathematical expression to summarize it.

7. Click on the Increase Pressure button **and listen to the audio**.

Increase Pressure

- (a) Why does the reaction mixture become darker?

8. Click on the Back button.

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9. Click on the Decrease Pressure button **and listen to the audio**.

Decrease Pressure

- (a) Write a mathematical expression that relates the pressure, volume and number of moles of a gas to one another that allows the effect of a change in any of those variables to predict the new conditions.

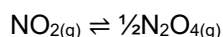
10. Click on the Back button.

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11. Click on the Change in Temperature button **and listen to the audio.**

Change in
Temperature

- (a) Write the K_c expression for the equilibrium shown.
- (b) Write the K_p expression for the equilibrium shown.
- (c) If the K_c for the reaction has a value of X , what is the value for the K_c of the reaction below?



12. Click on the Increase Temperature button **and listen to the audio.**

Increase Temperature

- (a) What will be the effect of adding heat to an equilibrium system that is exothermic in the forward direction?
- (b) What will be the effect of adding heat to an equilibrium system that is endothermic in the forward direction?

13. Click on the Back button.

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14. Click on the Decrease Temperature button **and listen to the audio.**

Decrease Temperature

- (a) Draw a Lewis structure for NO_2 .
- (b) Use the Lewis structure you have drawn in (a), to explain the formation of the N_2O_4 molecule.