

# LAB 17: LE CHATELIER'S PRINCIPLE

- This lab does NOT require a lab report.
- You will work with a partner for this lab.

## I Introduction

LeChatelier's principle states that: If an equilibrium system is subjected to a stress, the system will react to remove the stress. To remove a stress, a system can only do one of two things: form more products and use up reactants (shift right), OR reverse the reaction and form more reactants, using up products (shift left). In this experiment, you will form several equilibrium systems at different stations. Then, by putting different stresses on the systems, you will observe how equilibrium systems react to a stress.

## ! Warnings!

- This lab uses concentrated (12 M) HCl, hydrochloric acid. This is EXTREMELY dangerous. It is extremely corrosive to skin and eyes, so wear your safety goggles and apron. Its fumes are choking and poisonous, so use it only in the fume hood.
- This lab uses cobalt chloride dissolved in ethanol. Cobalt chloride is mildly toxic; do not ingest and clean up spills immediately. Wear your safety goggles. Ethanol is flammable, so keep away from open flames.

## 🧪 Procedure

*Experiment 1: Equilibrium in a Saturated Solution.*

You will investigate the equilibrium in a saturated sodium chloride solution:



### Directions

- 1) Set up your lab notebook.
- 2) Fill a test tube  $\frac{3}{4}$  full of the saturated NaCl solution (you can see the excess NaCl(s) lying on the beaker bottom to verify its saturation). Be careful not to transfer any solid NaCl into the test tube. This is your initial equilibrium state.
- 3) To this saturated (and solid-free) solution of NaCl, add some Cl<sup>-</sup> ions in the form of concentrated HCl.

	Initial Equilibrium Condition	Stress	Predicted Shift	Observations	Observed Shift
Experiment 1	Saturated NaCl(aq) solution	Add concentrated HCl(aq)			

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