

## The Common Ion Effect

Purpose: to examine the effect of common ions in saturated solutions.

Materials: You will need 6 small test tubes, a test tube rack, 2 rubber stoppers









Safety: Many of the chemicals in today's lab contain lead. Handle them with care. If you get any on your skin wash it off immediately. At the end of the lab all solutions should be placed in the waste container.

Procedure: Note: this procedure is summarized in the table below.

1. Place approximately 5 mL of saturated  $\text{PbCl}_2(\text{aq})$  into each of 4 test tubes.  $\text{PbCl}_2(\text{aq})$  can be dispensed from the buret labelled  $\text{PbCl}_2$ . If necessary, add  $\text{PbCl}_2$  to the buret from the beaker labelled  $\text{PbCl}_2$ .
2. From the  $\text{dH}_2\text{O}$  buret, dispense about 2.5 mL of distilled water into each of the two empty test tubes.
3. Add several scoops of  $\text{NaCl}$  to one of the test tubes containing water. Stopper and shake. Continue to add  $\text{NaCl}$ , stopper, and shake until a saturated solution is achieved (some  $\text{NaCl}$  does not dissolve).
4. To the last test tube (containing 2.5 mL distilled  $\text{H}_2\text{O}$ ), add several scoops of  $\text{NaC}_2\text{H}_3\text{O}_2$ . Stopper and shake. Continue to add  $\text{NaC}_2\text{H}_3\text{O}_2$ , stopper, and shake until a saturated solution is achieved.
5. Add some of the liquid from the saturated  $\text{NaCl}$  solution to a test tube containing  $\text{PbCl}_2(\text{aq})$ . Be careful not to add any solid  $\text{NaCl}$ . Record your observations.
6. Add some of the liquid from the saturated  $\text{NaC}_2\text{H}_3\text{O}_2$  solution to a test tube containing  $\text{PbCl}_2(\text{aq})$ . Be careful not to add any solid  $\text{NaC}_2\text{H}_3\text{O}_2$ . Record observations.
7. Add a few crystals of  $\text{Pb}(\text{C}_2\text{H}_3\text{O}_2)_2$  to a test tube containing  $\text{PbCl}_2(\text{aq})$ . Record observations.
8. Add a few drops of tap water to a test tube containing  $\text{PbCl}_2(\text{aq})$ . Record observations.
9. Dump all solutions in the waste container. Wash all glassware with soap and water. Rinse well.

Observations and conclusions:

1. The equilibrium that we are examining here is the dissociation of  $\text{PbCl}_2(\text{s})$  into its ions. Write the balanced chemical equilibrium:

	A	B	Result of mixing A + B	Explanation (according to Le Chatelier's principle)
1	 5 ml $\text{PbCl}_2$	 2.5 ml saturated $\text{NaCl}$		
2	 5 ml $\text{PbCl}_2$	 2.5 ml saturated $\text{NaC}_2\text{H}_3\text{O}_2$		
3	 5 ml $\text{PbCl}_2$	 A few crystals of $\text{Pb}(\text{C}_2\text{H}_3\text{O}_2)_2$		
4	 5 ml $\text{PbCl}_2$	 A few drops of tap water		

2. Define common ion:

3. Define common ion effect: