

Chemistry 12

Lab: Determination of Solubility Product Constant

Name:

Block:

Objectives:

1. To prepare a number of solutions with different $[\text{Pb}^{2+}]$ and $[\text{I}^-]$.
2. To mix combinations of the above solutions and observe whether a precipitate occurs.
3. To obtain an approximate value of K_{sp} for PbI_2 at room temperature.
4. To obtain the approximate value of K_{sp} for PbI_2 at temperatures higher than room temperature.

Procedure:

1. Put on safety goggles.
2. Obtain about 40 mL of each of **0.010M $\text{Pb}(\text{NO}_3)_2$** and **0.020M KI** in two labeled medium beakers.

($\text{Pb}(\text{NO}_3)_2$ is very toxic. Do not get any in your mouth and do not swallow any. Avoid getting an excessive amount on your skin since it can be absorbed. Wash away any spills or splashes with plenty of water.)
3. Obtain twelve test tubes and arrange them in two test tube racks, each with 6 test tubes. Label each set A to F.
4. In the first set of test tubes, place 10.0mL, 8.0 mL, 6.0 mL, 4.0 mL, 3.0 mL and 2.0 mL of $\text{Pb}(\text{NO}_3)_2$, by using a 10.0 mL pipette and pipette bulb.
5. Thoroughly rinse your pipette with water.
6. Add an amount of water to each tube (which you should have calculated) to make the volume in each up to 10.0 mL using your 10.0 mL pipette.
7. Thoroughly rinse your pipette with water.
8. Repeat steps 4, 5 and 6 with the test tubes in the second rack using KI.
9. Mix the contents of test tube A from the $\text{Pb}(\text{NO}_3)_2$ set with the contents of test tube A from the KI set. Repeat for test tube B to F.
10. Record in which test tubes a precipitate occurs in your data table.
11. For the test tubes that **have** a precipitate, place them in a hot water bath and begin heating with the hot plate. Set up a thermometer to record the temperature of your hot water bath.
12. Make sure that each test tube is clearly visible and monitored closely.

13. When the precipitate in each test tube dissolves, note the temperature of the water bath and record it in your data table.
14. Empty the contents of all test tubes into the designated waste container. (Try to do this before the precipitate forms again in the test tubes that were in the water bath).
15. Clean up your lab station.
16. Before leaving the laboratory, wash your hands thoroughly with soap and water and don't forget to compliment your lab partner(s) and your teacher.