**OBJECTIVES:**

To discover the relationship between soluble and low soluble compounds, we must:

* 1. To prepare a number of solutions containing lead(II) ions or iodide ions of differing concentrations
  2. To mix a combination of the above solutions and note whether a precipitate is formed.
  3. To determine an approximate Ksp value for the lead(II) iodide solution

**MATERIALS:**

***Apparatus***

|  |  |  |
| --- | --- | --- |
| * Safety Gear | * 12 – test tubes (18x150) | * 2 – 10mL Graduated Cylinders |
| * 2 – test tube racks | * 400mL Beaker | * 2-100mL Beakers |
| * Bunsen burner | * (3) Glass stir rods | * Ring stand and ring, wire gauze |
| * Thermometer | * Medicine dropper | * Wax pencil |

***Reagents***

|  |  |  |
| --- | --- | --- |
| * 0.010 M lead(II)nitrate | * 0.020 M potassium iodide | * Distilled water |

**PROCEDURE:**

1. Put on your safety gear and then collect the apparatus.
2. Obtain, in separate 100 mL beakers, about 40 mL of each of 0.010M lead(II)nitrate and 0.020M potassium iodide and make sure to label the beakers.
3. Arrange the 12 test tubes in the 2 test tube racks (6 in each). Label each set **A** to **F** with your wax pencil.
4. Into the first set of test tubes you will be making 6 different lead(II) nitrate solutions. Using the 10mL graduated cylinder obtain the following amounts of 0.010M lead(II)nitrate **precisely!!!**

|  |  |
| --- | --- |
| **Test tube** | **Volume of 0.010M Pb(NO3)2** |
| **A** | **10** mL |
| **B** | Precise amount between **7.5** and **9** mL |
| **C** | Precise amount between **5.5** and **7** mL |
| **D** | Precise amount between **3.5** and **5** mL |
| **E** | Precise amount between **2** and **3** mL |
| **F** | Precise amount between **0.5** and **2** mL |

1. Add an amount of distilled water to each tube to make the volume in each up to the 10.0mL mark respectively. *For example: No water needs to be added to* ***A****, but in* ***B*** *Joey Joe Joe obtained 8.6mL of Pb(NO3)2(aq) so he needs to add 1.4mL of* ***d H2O*** *to reach the 10.0mL mark.*
2. Repeat steps **4** and **5** with the test tubes in the second rack, using 0.020M potassium iodide instead. *Note: the volumes that you obtain of potassium iodide should be similar to those of lead(II)nitrate.*
3. Mix the contents of test tube **A** from the lead(II)nitrate set with the contents of test tube **A** from the potassium iodide set, and replace the test tube in the rack.
4. Repeat step **7** for each of the other five combinations. Just a reminder to be recording all observations.
5. Set your ring stand/ring apparatus with the Bunsen burner under the ring. *Note: make sure the ring is as low on the stand as possible to keep stability while heating.* Add about the 250mL of tap water into the 400mL beaker and place on the wire gauze (which is resting on the ring)
6. Place each of the test tubes which contain a precipitate in the beaker as well as a thermometer and begin heating **gently**. You will need to place a glass stir rod in each test tube to agitate the solid from the bottom of the test tube so it is NOT allowed to settle at the bottom while heating.
7. As soon as the precipitate dissolves fully, note the temperature of the water bath and record it.
8. Clean-up: Make sure the resulting solutions are placed in the designated waste beaker and all glass ware is washed thoroughly with tap water.

**Data and Observations**

*As part of your pre-lab you MUST come in to the lab prepared with a neatly drawn data table. What are all the important values that need to be written in the data section?*