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Chemistry 11

Solution Chemistry & Precipitation Reactions:
A Demonstration

Chemistry 11 Solution Chemistry & Precipitation Reactions: A Demonstration

Equipment needed: 1 giant test tube 38 x ??? (a useful gift from the Bamberton lab)
1 1000mL beaker
electric kettle
tap water (~1.5L)
0.01M lead II nitrate solution
0.02M potassium iodide solution
plastic bucket for disposal

I filled the kettle with water and plugged it in. Then I poured about 50mL of each solution one at a time into the test tube. A yellow precipitate of lead II iodide formed immediately. I used some of the time waiting for the water to boil to discuss the concentrations of the individual ions in the solutions. When the water boiled I poured it into the beaker to make a hot water bath and placed the test tube in the water bath. I asked students to predict what might happen as the temperature of the mixture increased. This pause in the action also gave me an opportunity to get the students thinking about what the yellow precipitate might be and to demonstrate how to use the solubility table.

The lead iodide did not completely dissolve at first so it was necessary to refill the water bath with boiling water. This worked after a few more minutes. I emptied out the water bath and allowed the test tube and the solution to cool while standing in the beaker. This pause gave me an opportunity to show how to develop net ionic equations from formula equations.

When the test tube had cooled to a temperature that I would describe as unpleasantly hot but not painful I took it out of the beaker and was able to show the students that small flaky golden crystals were starting to form from the solution. After warning the students about the dangers of lead poisoning I took the risk of allowing them to pass the test tube around for observation. This led to discussion of the effect of temperature on solubility and the reversibility of the dissociation/precipitation reaction. There was also enough time to make a rough calculation of the mass of the precipitate in the test tube in this reaction using the mole calculations from previous seminars.