

## Diffusion

### A. Diffusion in a water drop

1. Place 1 crystal of KI and ~6 crystals of  $\text{Pb}(\text{NO}_3)_2$  on a plastic surface. (To avoid contamination, wipe your metal spatula with a paper towel after using it to transfer each chemical.) Record any evidence of a reaction when they are placed together.
2. Add 1 drop of distilled water and stir. Again record your observations.
3. Write the molecular, complete ionic, and net ionic equations for the reaction that you observe. (Assume that the reactants are in solution before a reaction occurs.)
4. Since you probably concluded that the reaction occurred faster in aqueous solution, let's investigate further. Make a pool of water about 1.5 cm in diameter on the plastic; since the plastic is hydrophobic the water forms a nice pool.
5. Place 1 crystal of KI near the pool, but *not* in it. Place a few crystals of  $\text{Pb}(\text{NO}_3)_2$  near the opposite side of the pool.
6. Timing and the order in which you dissolve the crystals is important, so record exactly what you do. Push the  $\text{Pb}(\text{NO}_3)_2$  crystals into the edge of the pool, wait 5 seconds, and then push the KI crystals into the opposite edge of the pool. Record your observations.
7. Repeat steps 4-6 with different times and/or a different order for dissolving the crystals. You must perform at least 2 additional experiments. Which experiment was most visually exciting? Why?

#### Questions:

1. Compare the rate of diffusion of ions in solid crystals to the rate of diffusion of ions in solution.
2. How do your experiments in steps 4-7 illustrate diffusion?

### B. Diffusion in air

1. Obtain a clean, dry Petri dish from your lab kit. Remove the lid and place 1 drop of 6 M HCl on the inside of the lid.
2. Place 1 drop of 6 M  $\text{NH}_3$  on the inside of the bottom of the dish.
3. Gently turn the lid over without disturbing the HCl drop. (If you have trouble, your HCl drop may be too large.)
4. Put the lid on the dish and record your observations.
5. Repeat steps 1-4 with perhaps multiple drops on top and bottom, or perhaps just insure that the HCl and  $\text{NH}_3$  drops are over top of one another.

6. Write the molecular equation for the reaction that you observe.

### **Diffusion**

Equipment and Supplies:

KI crystals

Pb(NO<sub>3</sub>)<sub>2</sub> crystals

spatula for each bottle

Petri dish with lid (also can be used as the plastic reaction surface)

distilled water

6 M HCl

6 M NH<sub>3</sub>