

Lab - Solvents

Purpose: To investigate the solubility of several ionic and molecular substances in water, ethanol and lamp oil.

Procedure:

Develop a procedure that will test the solubility of *each* solute in *each* of the three solvents. The following restrictions need to be taken into account when developing this procedure:

- All solutes need to be tested in each of the different solvents
- For each solid solute, only 1 gram of solute can be used for the entire procedure.
- For each liquid solute, only 10 mL of solute can be used for the entire procedure.
- For each solvent, only 100 mL of solvent can be used for the entire procedure.
- A data table needs to be designed to hold the information that you will collect.
- Specify the amounts of solutes and solvents you will be using in each test.

Write a detailed procedure below. Detailed means simple enough even a freshman could follow it:

Before beginning this procedure, have your teacher read it for approval.

Data Table:

Questions:

- 1) According to your data, which of the tested solutes are least likely to dissolve in the Great Miami River? Why?
 - 2a) How does the behavior of ethanol as a solvent compare with that of water?
 - b) How does ethanol's behavior as a solvent compare with lamp oil?
- 3) Predict the solubility of each solid solute in
 - a) hexane, a liquid that is essentially insoluble in water.
 - b) ethylene glycol, a liquid that is very soluble in ethanol.
- 4) Given that water is a polar solvent and lamp oil is a nonpolar solvent, classify each solute tested as polar or nonpolar.
- 5) How useful is the rule "like dissolves like" for predicting solubility? Explain your answer based on your results.
- 6) How can water be both a solute and a solvent? How do you know when a substance is the solute or solvent?
- 7) Suppose we wanted to quantify (get a number for) the solubility of each substance in this lab. What additional steps would need to be taken to quantify the solubility?

Conclusion: