

MATERIALS - Tubifex worms or brine shrimps, 8 test tubes in a rack, graduated cylinder, wax pencil, dropper or forceps, 10 ml of 10% insecticidal soap, and tap water.

Our industrialized society produces large quantities of toxic chemicals which can be harmful to the environment, even in minute amounts when improperly disposed. The purpose of this lab is to measure the toxicity of a harmful chemical such as insecticidal soap. You will be preparing different dilutions of this chemical in order to determine the lowest concentration that is lethal to small organisms (such as worms and shrimps).

1. Label tubes - Label 8 test tubes with a wax pencil: 1-ten (parts per ten or 10%), 2-pph (hundred), 3-ppt (thousand), 4-pptt (ten thousand), 5-ppht (hundred thousand), 6-ppm (million), 7-pptm (ten million), and 8-pphm (hundred million).
2. First tube - Measure 10 ml of soap in a graduated cylinder, and transfer it to the first tube.
3. Second tube - To prepare the next dilution, transfer 1 ml from the previous tube into the next one. Then add 9 ml of tap water to this new tube.
4. Next tubes - Repeat the above procedure with all the remaining test tubes.
5. Organisms - Place exactly 10 worms or shrimps into tube without killing them.
6. LD<sub>50</sub> - After about an hour, count the number of organisms that are still alive and the number that are now dead in each test tube. The LD<sub>50</sub>, or lethal dose 50, is the lowest concentration of a chemical that will kill at least half of the organisms.

### QUESTIONS

1. Which of the organisms did you use: tubifex worms, brine shrimps, or both? How was it selected?
2. Record in a table, on back of this sheet, the numbers of organisms alive and dead in each tube.
3. How did you determine whether an organism was dead or still alive?
4. Which tube had the lowest concentration that killed at least one organism?
5. Which tube is the LD<sub>50</sub> (the lowest concentration that killed at least half the organisms)?
6. Do you think this LD<sub>50</sub> would be the same for larger and more complex organisms such as humans? Explain in detail why or why not.
7. Name 2 specific toxic chemicals that have been released in the environment through human activity.
8. Describe in detail 3 things that you can personally do to reduce toxic chemicals in the environment.