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Monitoring Ketone

MONITORING KEPONE

Recently, there has been speculation that fish and shellfish in the Chesapeake Bay may have become contaminated by kepone. Early this fall both Virginia's Governor Godwin and Maryland's Governor Mandel announced that such speculation had no basis in fact. To determine the facts about how much kepone contamination there is in the Bay, a staff member of EPN went to Richmond and spoke to an Assistant Attorney General for Health. The Assistant Attorney General had done considerable work on Virginia's kepone problem.

Before delving into the technical aspects of kepone control, he gave us some background information. Kepone is one of a group of non-specific poisons which have long half-lives: from 15 to 20 years. It will take that long for half of the kepone to disintegrate. Also, it has a high lipid solubility. This means that the chemical is not easily biodegradable, and has a tendency to concentrate in the tissue of plants and animals. This, in turn, means that when we look at the toxicity of kepone one must keep in mind its tendency to accumulate in living tissue over time.

An example of a similar phenomenon is what DDT did to the osprey egg. Although the DDT concentration in rivers and streams was less than ½part per million, that level proved high enough to threaten the osprey population with extinction. Plants which absorbed the DDT were eaten by fish which retained the chemical. The fish in turn were eaten by ospreys which also retained the chemical. Over a period of time, the DDT accumulated to levels that caused

structural weakness in the birds' egg shells. The eggs would crack in the nest and kill the embryonic ospreys. Kepone has a similar tendency to accumulate in living tissue and analogous results to DDT are foreseeable. Its effect on humans is already evident from the experience of individuals who worked for Life Sciences Corporation in Hopewell. Employees were exposed to high concentrations of the chemical, but no one knows at what concentration level kepone becomes harmful to humans.

The EPA has set out to keep the kepone concentration in the nearby waters at a level below 1 part per million. This concentration ceiling is an arbitrary figure, but given the tendency of the chemical to build up in tissue, and its long half-life in the environment, it is considered not an unreasonable figure. So far, the data base is too small for there to be any rational basis for this concentration ceiling. There is no proof that 1 part per million will hurt anyone.

The scientists are able to monitor the kepone buildup in fish by dissolving samples of tissue from freshly caught fish in nitric aicd, which destroys the fish but leaves the kepone unaffected. By running the kepone sample through a gas chromatography column the kepone concentration in that sample can be analyzed. Presumably, if the concentration reaches levels in excess of 1 part per million then fishing in the area must be discontinued.

All this indicates that keeping track of kepone is a science of approximations and estimates. It also indicates that no one really knows how much kepone is too much. No doubt, the local fishing industry, because of the great economic hardship, thinks that careful consideration should be given these factors before decisions are made to shut down the Chesapeake Bay. There is a certain amount of logic to this reasoning. But it should be remembered that kepone accumulates in tissue over time, and the purpose of control is to protect life.