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ABCs of PCBs

Basics first

What are PCBs?

PCBs, or polychlorinated biphenyls, are chemical compounds similar to DDT and dieldrin.

They are generally colorless, odorless liquids with a thick molasses-like consistency. They are fire resistant, having high boiling points. PCBs do not dissolve easily in water, do not readily conduct electricity and are poor conductors of heat.

What are they used for?

Because of their chemical stability and their low conductivity of heat and electricity, PCBs are very useful as industrial chemicals. The primary uses of PCBs at present are in the coolant insulation fluids in electrical transformers and capacitors.

Presently, about 70 per cent of the PCBs, produced in the U.S. are used in capacitors; the other 30 per cent, in transformers.

Prior to 1971, PCBs saw a much greater variety of uses. They were added to adhesives, plastics, paints, varnishes, sealants and other surface coatings, and they were widespread as a component of carbonless carbon papers.

Who makes PCBs?

PCBs were discovered in 1881, but it wasn't until 1929 that industrial uses were found for these compounds and they began to be manufactured commercially.

The Monsanto Industrial Chemicals Company is the sole manufacturer of PCBs in the United States. They market their product under the trade name, Aroclor.

In 1971 when PCBs began to be recognized as a problem, Monsanto voluntarily restricted the sale of the compound to only those uses in closed electrical systems in which they could not easily escape into the environment.

Since then, annual U.S. sales of PCBs have been cut in half. Monsanto Company is now producing 35-40 million pounds of PCBs per year.

In addition to Monsanto, there are several foreign companies producing PCBs without restrictions on their use. Recent estimates from the Environmental Protection Agency indicate that the U.S. is importing 500,000 pounds of these chemicals per year, and an unknown amount in PCB-containing products.

According to the EPA, about 1.4 billion pounds of PCBs have been produced in the United States over the past 45 years. Of that amount, over half has already entered the environment through discharges to the air, water and land.

Why are PCBs a problem?

Studies have shown that PCBs are highly toxic to animals and man.

They were first recognized as a problem by scientists in Sweden in 1966.

But they came to world-wide attention in 1968 when five

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people died and 1,900 others were stricken in Japan after eating cooking oil contaminated by PCBs. Since that time, Japan has banned all import and production of these compounds.

PCBs came back into the news recently in this country when it was discovered that high, possibly dangerous levels of these compounds were being found in some freshwater fish, particularly in the Great Lakes. Although severe injury from short-term exposure to PCBs is unlikely, scientists are concerned about the effects caused by long-term, low level exposure to the compounds.

The fact that PCBs seem to persist in the environment for long periods of time and are hard to eliminate makes them more of a threat. Today these compounds are found all over the glove — in Arctic polar bears, New York chickens, England's rainfall, human blood plasma, the world's oceans and mother's milk.

How do PCBs get into the environment?

Through the soil:

Almost three-fourths of the amount of discarded PCBs have ended up in our nation's dumping grounds—in junked plastics, paints and, primarily, in abandoned capacitors and transformers. In junk yards PCBs can slowly leak out and can be washed by rain and melted snow into nearby waterw. .

Through the water:

The world's rivers, lakes and oceans have been the traditional sewers and sinks for its wastes. Until recent years, these waters seemed a suitable place for disposing of PCBs and many other questionable compounds.

But fish can take up PCBs through their gills, fins and skin. PCBs also adhere to small particles in the water and thus are taken in by lower forms of aquatic life and passed up through the food chain to the top predators, fish and fish-eating birds and mammals.

Scientists have found that some fish contain concentrations of PCBs that are 100,000 to a million times greater than the concentrations in surrounding waters.

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