PA
NEWS
DISPATCH
D. 25,371

AUG 17 1977

Biphenyls harmful hydrocarbons

4279

Gannett News Service Special

Polychlorinated biphenyls, first synthesized in 1881, belong to a class of chemicals called chlorinated hydrocarbons, which include most of the common pesticides and solvents.

Many of the substances, such as DDT, Mirex, dieldrin, aldrin and trichlorethylene, have been banned after causing cancer in test animals. Another substance, vinyl chloride, has caused cancer in humans.

The hydrocarbon part of the chemical is a molecule composed of hydrogen and carbon, the building block of petroleum, gasoline and other fuels. Two attached "rings" of hydrocarbons are extremely flammable.

But scientists found that by substituting chlorine atoms for hydrogens in the biphenyl, they could create a substance that was flame-resistant. Such molecules with more than one chlorine atom are called polychlorinated biphenyls, or PCBs.

About 1.4 billion pounds of polychlorinated biphenyls have been produced in this country in five decades. Four per cent of the total has been destroyed, 11 per cent is free in the environment, and 19 per cent is under varying degrees of control in landfills. The rest is in billions of items not yet discarded. The EPA is studying regulations to stop the discarding of more of the material but acknowledges that that will be difficult.

In 1929, Monsanto Chemical Co. of St. Louis began producing PCBs commercially, for use as a flame-retardant and electrical insulator in transformers, capacitors and similar equipment. It replaced mineral oils, which had resulted in many fires.

So perfect were PCBs that within a few years they became the fluid of choice in the electrical industry. In addition to preventing fires, they were so stable as to be resistant to strong acids and bases and biological degradation.

Soon, numerous other uses were found.

The chemicals are able to absorb and hold large amounts of heat, so they were used in heating coils to heat products in factories, where an open flame would have caused a hazard.

PCBs extended the life of caulking compounds around the windows of skyscrapers. Since PCBs would not react with ink, they prevented smears on carbonless copy paper.

They became a lubricating and cooling oil for industrial drills. In the electric motors of refrigerators, air-conditioners, typewriters, power saws, clothes washers and dryers, dishwashers and furnace blowers, PCBs became common.

In capacitors, or "boosters," they held an extra electric charge to help start fluorescent lights.