PCBs in the Last Frontier: A Case Study on the Scientific Method

бу

Michael Tessmer

Chemistry Department Southwestern College, Winfield, KS

Part I—PCBs

Polychlorinated biphenyls (PCBS) are compounds that were once used as insulators in electrical transmission lines and in the production of polymers. Each PCB differs by the quantity and location of the chlorine atoms. An example of one of the many different PCBs is shown to the right.

PCB production was halted in 1977 due to their potential toxicity, but the chemicals are still found in the environment due to their stability. Studies in remote areas of Alaska have shown that PCBs can even be found in lakes untouched by humans. There is no known natural process that produces PCBs, so all of the PCBs in existence are presumed to have been produced by humans.





2,2',4,4',5-Pentachlorobiphenyl

Questions

- 1. What scientific observation about PCB distribution is described above?
- 2. Propose a hypothesis or "explanatory story" to explain the global movement of pollutants such as PCBs. Specifically, how could they end up in the most remote Alaskan lakes?
- 3. Propose a method, either through observations or direct experimentation, which would test your hypothesis from Question 2. (Note: Your approach may be on a local scale despite examining a global phenomenon.)