Persistent Bioaccumulative and Toxic (Pbt) Chemicals Encyclopedia Article

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Persistent Bioaccumulative and Toxic (Pbt) Chemicals

Persistent bioaccumulative and toxic (PBT) chemicals represent a group of substances that are not easily degraded, accumulate in organisms, and exhibit an acute or chronic toxicity. They may therefore pose serious concerns for human and environmental health. The effects of PBTs range from cancer, endocrine disruption, reproductive dysfunction, behavioral abnormalities, birth defects, disturbance of the immune system, damage to the liver and nervous system, to the extinction of whole populations.

The category PBT was defined by the United Nations Environmental Programme (UNEP). Persistent organic pollutants (POPs) are an integral part of the PBT group, which additionally includes trace metals and organo-metal compounds. A large proportion of PBTs are organohalogens—namely, organochlorine pesticides, polychlorinated biphenyls (PCBs), polychlorinated naphthalenes (PCN), chloroparaffins, and brominated flame retardants. Further PBTs are polycyclic aromatic hydrocarbons (PAH), metals and their compounds (e.g., the antifouling tributyltin TBT), and phthalates (plasticizers). In 1999 the Environmental Protection Agency (EPA) listed fourteen priority PBTs, most of which belong to the so-called dirty dozen identified by the UNEP: six pesticides, PCBs, hexachlorobenzene, octachlorostyrene, dioxins and furans, benzo(a)pyrene, alkyllead, and mercury and its compounds. The UNEP Stockholm Convention, signed in 2001, established control and phase-out measures for that initial set of twelve POPs. In response, some nations devised action plans to prevent the introduction of new PBTs into the marketplace, to identify further priority PBTs, and to phase out or reduce the emissions of priority PBTs.

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Internet Resource

U.S. Environmental Protection Agency. "Persistent, Bioaccumulative and Toxic (PBT) Chemicals Program." Available from http://www.epa.gov/pbt.