“Dioxins” commonly refers to a group of compounds of three closely related families that share certain chemical and biological properties. These families are:

- Chlorinated dibenzo-p-dioxins (PCDD)
- Chlorinated dibenzofurans (PCDF)
- Certain polychlorinated biphenyls (PCB)

Due to their high stability, dioxins are classified as persistent organic pollutants, or POPs. They remain in the environment for a long time. While there are 210 different types of PCDD/PCDF, only seventeen of them are dealt with in ACAP’s risk assessment of dioxin exposure. The reason for this is that these seventeen types show extreme toxicological potency.

Dioxins are formed unintentionally in many industrial processes, but they can also be formed naturally in the environment at high temperatures, such as in forest fires and volcanoes.
Important formation sources include both large- and small-scale combustion, especially combustion of waste. Combustion of waste has been identified as a potential major source of dioxin emissions into the atmosphere.

Other important dioxin sources are found in the chemical industry, especially in the production of chlorinated organic compounds. The majority of the dioxins formed in the chemical industry do not directly contaminate the environment via atmospheric pollution, but in the release of the products themselves.

Dioxins are also formed in the bleaching of pulp and paper products, especially when the bleaching is done with molecular chlorine. In this case, environmental contamination from the bleaching process occurs via the effluent. However, chlorine-free processes that do not use chlorine gas have, to a large extent, replaced chlorine bleaching.

Once emitted into the atmosphere, dioxins can undergo long-range transport. As a result, dioxins are covered in both the Stockholm Convention and the POPs protocol of the Convention on Long-range Transboundary Air Pollution. Long-range transport of dioxins is the main reason for their occurrence in the Arctic.

Dioxins are highly toxic. They can interfere with hormones, and can cause cancer, reproductive and developmental problems, and damage to the immune system. Dioxins are found in the environment throughout the world, and they accumulate in the food chain, mainly in the fatty tissue of animals.

Contacts

POPs and Mercury Expert Group Chair
Åke Mikaelsson
åke.mikaelsson@naturvardsverket.se

For general questions about ACAP
ACAP Secretariat
acap@arctic-council.org