

Canadian Environmental Protection Act

**PRIORITY SUBSTANCES LIST
ASSESSMENT REPORT**

CHLORINATED PARAFFINS

Government of Canada
Environment Canada
Health and Welfare Canada

Also available in French under the title:
Loi canadienne sur la protection de l'environnement
Liste des substances d'intérêt prioritaire
Rapport d'évaluation:
Paraffines chlorées

Synopsis

The term "chlorinated paraffin waxes" is generally restricted to chlorinated paraffins having long carbon chains (i.e., \geq C18). However, the scope of this assessment was broadened to include the short chain (i.e., \leq C13) and medium chain (i.e., C14-17) chlorinated paraffins which are also of concern because of their potential effects on the environment and human health.

Chlorinated paraffins (CPs) are produced in, and imported into, Canada for use as plasticizers and flame retardants as well as extreme-pressure additives in lubricating oils. They are persistent compounds and have the potential to bioaccumulate in aquatic organisms. No data were identified on the concentrations of these substances in any medium in the Canadian environment. However, data from other countries (including the United States) where these compounds are produced and used confirm their presence in the environment, particularly near production facilities.

Short chain chlorinated paraffins cause adverse effects in fish and aquatic invertebrates at concentrations below 1 $\mu\text{g/L}$ in laboratory studies. However, owing to the lack of information on concentrations of short chain chlorinated paraffins in the Canadian environment, it is not possible to estimate exposure of Canadian biota or to compare this exposure with levels estimated to cause adverse effects.

Short chain chlorinated paraffins have caused cancer in experimental animals, although relevant data for humans are not available. Therefore, short chain chlorinated paraffins are considered to be "non-threshold toxicants", i.e., substances for which there is believed to be some chance of adverse effects at any level of exposure. For such substances, where data permit, estimated exposure is compared to quantitative estimates of cancer potency in order to characterize risk and provide guidance for further action, such as analysis of options to reduce exposure, under the Canadian Environmental Protection Act (CEPA). However, owing to the lack of information on concentrations of short chain chlorinated paraffins in environmental media to which humans are exposed, it is not possible to quantitatively estimate the total average daily intake of these compounds by the general population in Canada, or to subsequently compare these values to quantitative estimates of cancer potency.

There is also a lack of information on concentrations of medium and long chain chlorinated paraffins in environmental media to which humans and other biota are exposed. Therefore, it is not possible to estimate exposure of Canadian biota or to compare this exposure with levels estimated to cause adverse effects. Similarly, it is not possible to quantitatively estimate the total average daily intake of these compounds by the general population in Canada. The Tolerable Daily Intakes (i.e., the intake to which it is believed that a person can be exposed over a lifetime without deleterious effect) are derived on the basis of data from bioassays in animal species for these two groups of chlorinated paraffins and therefore cannot be compared with the estimated total daily intake in the general environment in Canada.

None of the chlorinated paraffins volatilizes readily to the atmosphere. Due to their predicted short tropospheric residence time (a few days), these compounds are not expected to contribute significantly to depletion of stratospheric ozone or global warming.

Based on these considerations, the Minister of the Environment and the Minister of National Health and Welfare have concluded that short chain chlorinated paraffins are considered to be "toxic" as defined under Paragraph 11(c) of the Canadian Environmental Protection Act. Available data are considered inadequate to evaluate whether medium and long chain chlorinated paraffins are considered to be "toxic" as defined under Paragraphs 11(a) or (c) of the Canadian Environmental Protection Act.