Summary of Risk Assessment Conducted Pursuant to subsection 83(1) of the *Canadian Environmental Protection Act, 1999*

New Substances Notification No. 19218: Hexafluoroalkene (Confidential Accession No. 19190-8)

Regulatory decisions

Under the provisions for Substances and Activities New to Canada in Part 5 of the *Canadian Environmental Protection Act, 1999* (CEPA), and pursuant to section 83 of the Act, the Minister of the Environment and the Minister of Health have assessed information in respect of the substance and have determined that it is not anticipated to enter the environment in a quantity or concentration or under conditions that have or may have an immediate or long term harmful effect on the environment or its biological diversity, constitute or may constitute a danger to the environment on which life depends, or constitute or may constitute a danger in Canada to human life or health.

Substance identity

The notified chemical is hexafluoroalkene (Confidential Accession No. 19190-8), which can be classified as a hydrofluoroolefin (HFO).

Notified and potential activities

The substance is proposed to be manufactured in and/or imported into Canada in quantities greater than 10 000 kg/yr for the notified use in industrial thermal insulation. Potential uses may include a variety of consumer applications, such as personal care products and cleaning products.

Environmental fate and behaviour

Based on its physical and chemical properties, if released to the environment, the substance will tend to partition to air. The substance is expected to be persistent in air based on its free radical reaction rate coefficient resulting in an expected half-life >2 days. The substance is not expected to bioaccumulate based on its low octanol-water partition coefficient (log K_{ow} 0-3), its expected rapid volatilization to air and subsequent rapid degradation.

The photochemical ozone creation potential of the substance is considered to be low. The ozone depletion potential of the substance is considered to be negligible given that the substance is resistant to oxidation and is expected to form stable bonds with atmospheric water and methane. The global warming potential is considered low.

Ecological assessment

The notified substance exists as a gas at environmental temperatures. No releases to the aquatic environment are expected and any amount released to water would rapidly volatize given the very high vapour pressure of the substance (>13 332 Pa). As such, exposure of aquatic life to the substance is not expected. Point source releases to air are expected to rapidly disperse and would not result in a concentration of the substance in air which would pose a risk to wildlife.

As the substance will reside in the atmosphere, the concentration in the aquatic compartment was not predicted. However, assessments of photochemical ozone creation potential, ozone depletion potential and global warming potential were conducted. In each case, the impact is considered low. Direct environmental exposure from the notified activities are not expected as the substance is used in systems with releases expected to be gradual and dispersed. Any substance released would reside in the atmosphere. No potential activities which could significantly increase environmental risks compared to those notified were identified.

Based on gradual dispersed release to the atmosphere and the lack of environmental impact as a result of its presence in the atmosphere, the substance is unlikely to cause ecological harm in Canada.

Human health assessment

Based on the available hazard information, the substance has a low potential for acute toxicity by the inhalation route of exposure (median lethal concentration >2500 ppm) and low subchronic toxicity following repeat inhalation doses in mammalian test animals (21-day, 28-day and 13-week no-observed-adverse-effect concentration (NOAEC) >3 mg/L/6 hour). The substance has low developmental toxicity following repeat inhalation doses in mammalian test animals (NOAEC >20 mg/L/day). The substance does not cause acute cardiac sensitization at levels of <80 000 ppm (inhalation dose in mammalian test animals). It is not mutagenic *in vitro* and is not clastogenic *in vitro* or *in vivo*. Therefore, the substance is unlikely to cause genetic damage.

When the notified substance is used in thermal control or aerosol applications, direct exposure of the general population is not expected due to the industrial nature of the use. When the notified substance is used in etching applications, direct exposure of the general population is not expected as the substance will be consumed or degraded during use. When the notified substance is used in foam applications, consumers may come into contact with end-use products containing the substance; however, direct exposure is not expected because the substance will be trapped within the foam and will be unavailable for uptake. The substance may diffuse from foam products over time; however, direct inhalation exposure is expected to be low given the slow release of the substance. Indirect exposure of the general population from environmental media such as air is not expected given the specialized industrial use of the substance, which results in little or no release to the environment, and the rapid dispersion in air of any released substance.

If the substance is used in consumer aerosols, direct exposure of the general population is expected to be mainly by inhalation at low levels given the limited amount of substance released during use and rapid dispersion in air. Indirect exposure of the general population from environmental media such as air is expected to be similar to that of the notified use.

Based on the low toxicity and low potential for exposure, the substance is not likely to pose a significant health risk to the general population, and is therefore unlikely to be harmful to human health.

Assessment conclusion

When the substance is used as notified or for other identified potential activities, it is not expected to be harmful to human health or the environment according to the criteria under section 64 of the Act.

A conclusion under CEPA, on this substance, is not relevant to, nor does it preclude an assessment against the hazard criteria for Workplace Hazardous Materials Information System that are specified in the *Controlled Products Regulations* or *Hazardous Products Regulations* for products intended for the workplace.