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

New Substances Notification No. 17995: Zirconium, chloro hydroxy lactate oxo sodium complexes

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 that 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

Zirconium, chloro hydroxy lactate oxo sodium complexes (Chemical Abstracts Service Registry No. 174206-15-6) is a chemical that can be classified as a metal organic hydroxy complex.

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 use as a cross-linking agent used in oil field fracking applications and paper and non-woven fabric applications. Potential uses may include printing inks, paints, coatings, corrosion protection products, adhesives, or the production of various polymers.

Environmental Fate and Behaviour

Based on its physical and chemical properties, if released to the environment, the substance will tend to partition to water and settle to sediment. The substance is not expected to be persistent in water because the substance is expected to readily degrade into zirconium dioxide and lactic acid (transformation products) once released to water. Lactic acid is expected to biodegrade into innocuous substances. Zirconium dioxide is considered persistent although it is not expected to be mobile due to its low water solubility. The substance and the transformation products (zirconium dioxide and lactic acid) are not expected to bioaccumulate.

Ecological Assessment

Based on the available hazard information on the substance, the substance has low acute toxicity in aquatic organisms (median lethal concentration (LC_{50}) >100 mg/L). The acute ecotoxicity of zirconium dioxide is low in aquatic organisms (LC_{50} >100 mg /L), and the acute ecotoxicity of lactic acid is also low (LC_{50} >100 mg/L). A predicted no-effect concentration was not calculated for the substance and its transformation products given their low potential for ecological hazard.

No significant releases are expected from the notified uses of the substance, and given the low potential hazard associated with the substance and its transformation products, a predicted environmental concentration was not calculated.

Based on the environmental fate and low potential for ecological hazard, the substance is unlikely to cause ecological harm in Canada.

Human Health Assessment

Based on the available hazard information on the substance, the substance has a low potential for acute toxicity by the oral route of exposure (median lethal dose >2000 mg/kg body weight). It is a minimal skin irritant (primary irritation index of 0.1-0.5) and a mild eye irritant (maximum average score of 2.3-15). Based on information from surrogate substances, the notified substance is not expected to be mutagenic *in vitro*.

When used industrially as a cross-linking agent in oil field fracking applications and paper and non-woven fabric applications, direct exposure of the general population is expected to be low. Indirect exposure of the general population from environmental media such as drinking water and air is expected to be very low. The substance has potential for use in printing inks, paints and coatings, corrosion protection products and adhesives, or in the production of various polymers. Direct and indirect exposures of the general population from any potential use applications are expected to be low.

Based on the low likelihood of exposure in conjunction with the hazard, 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 used as notified or for other identified potential uses, the substance is not suspected to be harmful to human health or the environment according to the criteria under section 64 of CEPA.

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 the *Hazardous Products Regulations* for products intended for workplace use.