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

New Substances Notification 20712: Phosphonic acid, *P*,*P*'-(1-hydroxydodecylidene)bis- (Chemical Abstracts Service Registry Number 16610-63-2)

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 determined that the substance is anticipated to constitute or may constitute a danger in Canada to human life or health.

In order to ensure that the substance does not cause harm to the Canadian environment or human health, its manufacture and import are authorized subject to conditions as described in Ministerial Condition No. 20712 published in the *Canada Gazette* Part I, Vol. 155, No. 28 on July 10, 2021.

Substance identity

The notified chemical is phosphonic acid, *P*,*P*'-(1-hydroxydodecylidene)bis- (Chemical Abstracts Service Registry Number[1] 16610-63-2).

Notified uses

The substance is proposed to be imported into Canada in quantities less than 10 000 kg/yr for the notified use in cosmetics.

Environmental fate and behaviour

Based on its physical and chemical properties, if the substance is released to the environment, it will tend to partition to water, soil, and sediment. As a surfactant-type substance, some of the substance will also be present at the surface of the water or suspended organic matter. The substance may be persistent in these compartments based on low biodegradation but may not be persistent based on photolysis. The substance is not expected to bioaccumulate based on very low predicted distribution coefficients (log D ≤0).

Environmental risk assessment

1 The Chemical Abstracts Service Registry Number is the property of the American Chemical Society and any use or redistribution, except as required in supporting regulatory requirements and/or for reports to the Government of Canada when the information and the reports are required by law or administrative policy, is not permitted without the prior, written permission of the American Chemical Society.

Based on the available hazard information, the substance has low acute toxicity to fish (median lethal concentration > 100 mg/L) and aquatic invertebrates (median effective concentration > 100 mg/L). A predicted no-effect concentration was not calculated given the low potential for hazard to the environment.

The notified activities in Canada were assessed to estimate the environmental exposure potential of the substance throughout its life cycle. Environmental exposure from the notified activities is expected to be mainly from formulation and use by release of the substance to water resulting in a predicted environmental concentration in the range of 1-10 µg/L.

Based on the low potential for ecotoxicity and environmental exposure, the substance is unlikely to cause harm to the environment in Canada.

Human health risk assessment

Based on the available hazard information, the substance is expected to have a moderate acute toxicity by the oral route (median lethal dose > 300 mg/kg body weight) and high subchronic toxicity following repeated oral doses in mammalian test animals (28-day no-observed-adverse-effect level (NOAEL) <300 mg/kg-bw/day), as with other bisphosphonates. The substance is expected to have reproductive/developmental toxicity following repeated oral doses in mammalian test animals. It is a weak skin sensitizer (0-8% response (guinea pig maximization test)). It is not mutagenic *in vitro* and is not expected to be clastogenic *in vitro* or *in vivo*. Therefore, the substance is unlikely to cause genetic damage. The substance contains a structural feature (bisphosphonate) associated with adverse human health effects.

When the notified substance is used in cosmetics, direct exposure of the general population is expected to be mainly by contact with the skin at levels in the range of 1-10 mg/kg-bw/day for children and adults. Indirect exposure of the general population from environmental media such as drinking water is conservatively estimated to be at levels in the range of 10^{-6} – 10^{-5} mg/kg-bw/day for children and adults and mainly by ingestion.

The target margin of exposure (MOE_T) was calculated to be 1000 based on the available information. The MOE_T is the level of exposure at or above which there is no expected risk in the exposed population. The derived margin of exposure (MOE_D) is the ratio of the point of departure (POD) value to the available exposure doses and is compared to the MOE_T. The MOE_D was calculated to be in the range of 20-200 based on the POD (the NOAEL of the oral subchronic toxicity study in mammalian test animals). Because the MOE_D is less than the derived MOE_T, the substance is anticipated to be harmful to human health. These risks are associated with use of the substance in cosmetic products. When the substance is limited to use in leave-on hairstyling, leave-on makeup and rinse-off cosmetic products, the MOE_D is higher than the MOE_T and 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.

The assumptions made in the assessment and the risk management measures applied are considered to be adequately protective for the general population as well as for subpopulations who may be more susceptible or highly exposed.

Assessment conclusion

The substance is suspected to constitute a danger to human health according to the criteria under paragraph 64 (c), but is not suspected to have a harmful effect on the environment according to the criteria under paragraph 64 (a) or (b) of the Act.

Due to the identified risk to human health related to the subchronic toxicity, a ministerial condition was issued to restrict the manner in which the notifier may manufacture or import the substance with conditions on its use in order to mitigate these potential risks. Ministerial Condition No. 20712 was published in the *Canada Gazette* Part I, Vol. 155, No. 28 on July 10, 2021.

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 the workplace.