TSCA Section 5(a)(3) Determination for Premanufacture Notice (PMN) P-18-0284

Number: P-18-0284
TSCA Section 5(a)(3) Determination: The chemical substance is not likely to present an unreasonable risk (5(a)(3)(C))

Chemical Name:
Generic: Inorganic acid, reaction products with alkyl alcohol

Conditions of Use (intended, known, or reasonably foreseen)[1]:
Intended conditions of use (generic): Manufacture for use as, and use as a polymer composite additive, consistent with the manufacturing, processing, use, distribution, and disposal information described in the PMN.
Known conditions of use: Applying such factors as described in footnote 1, EPA evaluated whether there are known conditions of use and found none.
Reasonably foreseen conditions of use: Applying such factors as described in footnote 1, EPA evaluated whether there are reasonably foreseen conditions of use and found none.

Summary: The chemical substance is not likely to present an unreasonable risk of injury to health or the environment, without consideration of costs or other nonrisk factors, including an unreasonable risk to a potentially exposed or susceptible subpopulation identified as relevant by the Administrator under the conditions of use, based on the risk assessment presented below. Although EPA estimated that the new chemical substance's hydrolysis product could be persistent in anaerobic environments, the hydrolysis product has low potential for bioaccumulation, such that repeated exposures are not expected to be cumulative. Based on EPA's TSCA New Chemicals Program Chemical Categories for [claimed CBI] and Neutral Organics[2], and test data on the new chemical substance and analogous chemical substances, EPA estimates that the chemical substance has low environmental hazard and potential for the

[1] Under TSCA § 3(4), the term "conditions of use" means "the circumstances, as determined by the Administrator, under which a chemical substance is intended, known, or reasonably foreseen to be manufactured, processed, distributed in commerce, used, or disposed of." In general, EPA considers the intended conditions of use of a new chemical substance to be those identified in the section 5(a) notification. Known conditions of use include activities within the United States that result from manufacture that is exempt from PMN submission requirements. Reasonably foreseen conditions of use are future circumstances, distinct from known or intended conditions of use, under which the Administrator expects the chemical substance to be manufactured, processed, distributed, used, or disposed of. The identification of "reasonably foreseen" conditions of use will necessarily be a case-by-case determination and will be highly fact-specific. Reasonably foreseen conditions of use will not be based on hypotheticals or conjecture. EPA's identification of conditions of use includes the expectation of compliance with federal and state laws, such as worker protection standards or disposal restrictions, unless case-specific facts indicate otherwise. Accordingly, EPA will apply its professional judgment, experience, and discretion when considering such factors as evidence of current use of the new chemical substance outside the United States, evidence that the PMN substance is sufficiently likely to be used for the same purposes as existing chemical substances that are structurally analogous to the new chemical substance, and conditions of use identified in an initial PMN submission that the submitter omits in a revised PMN. The sources EPA uses to identify reasonably foreseen conditions of use include searches of internal confidential EPA PMN databases (containing use information on analogue chemicals), other U.S. government public sources, the National Library of Medicine's Hazardous Substances Data Bank (HSDB), the Chemical Abstract Service STN Platform, REACH Dossiers, technical encyclopedias (e.g., Kirk-Othmer and Ullmann), and Internet searches.
[2] TSCA New Chemicals Program (NCP) Chemical Categories. https://www.epa.gov/reviewing-new-chemicals-under-toxic-substances-control-act-tsca/chemical-categories-used-review-new.

following human health hazards: developmental/reproductive toxicity, neurological effects, blood effects, irritation, and lung effects. EPA concludes that the new chemical substance is not likely to present an unreasonable risk under the conditions of use.

Fate: Environmental fate is the determination of which environmental compartment(s) a chemical moves to, the expected residence time in the environmental compartment(s) and removal and degradation processes. Environmental fate is an important factor in determining exposure and thus in determining whether a chemical may present an unreasonable risk. EPA estimated physical/chemical and fate properties of this new chemical substance and a hydrolysis product using data for analogous chemicals and EPI (Estimation Programs Interface) Suite™, a suite of physical/chemical property and environmental fate estimation programs (http://www.epa.gov/tsca-screening-tools/epi-suitetm-estimation-program-interface). The new chemical substance is estimated to be removed during wastewater treatment with an efficiency of 90% via sorption and hydrolysis. The new chemical substance is expected to hydrolyze; therefore, the fate properties of a hydrolysis product [claimed CBI] were assessed. The hydrolysis product is estimated to be removed during wastewater treatment with an efficiency of 90% based on sorption and biodegradation. EPA estimated that removal of the hydrolysis product by biodegradation is high. For the hydrolysis product, sorption to sludge is estimated to be strong, and sorption to soil and sediment is estimated to be very strong, resulting in negligible migration to groundwater. Volatilization to air is estimated to be negligible for the hydrolysis product. Overall, these estimates are indicative of low potential for this chemical substance and its hydrolysis products to volatilize into the air and a low potential for this chemical substance and its hydrolysis products to migrate into groundwater.

Persistence[3]: Persistence is relevant to whether a new chemical substance is likely to present an unreasonable risk because chemicals that are not degraded in the environment at rates that prevent substantial buildup in the environment, and thus increase potential for exposure, may present a risk if the substance presents a hazard to human health or the environment. EPA estimated the new chemical substance's hydrolysis half-life to be days. EPA estimated the biodegradation half-lives of the new chemical substance's hydrolysis product, [claimed CBI], using measured data on [claimed CBI]. EPA estimated the hydrolysis product's aerobic and anaerobic biodegradation half-lives to be less than two months, and two to six months, respectively. These estimates indicate that the new chemical substance will not be persistent, while the [claimed CBI] hydrolysis product will not be persistent in aerobic environments (e.g., surface water) and may be persistent in anaerobic environments (e.g., sediment).

Bioaccumulation[4]: Bioaccumulation is relevant to whether a new chemical substance is likely to present an unreasonable risk because substances that bioaccumulate in aquatic and/or

[3] Persistence: A chemical substance is considered to have limited persistence if it has a half-life in water, soil or sediment of less than 2 months or there are equivalent or analogous data. A chemical substance is considered to be persistent if it has a half-life in water, soil or sediments of greater than 2 months but less than or equal to 6 months or if there are equivalent or analogous data. A chemical substance is considered to be very persistent if it has a half-life in water, soil or sediments of greater than 6 months or there are equivalent or analogous data. (64 FR 60194; November 4, 1999)

[4] Bioaccumulation: A chemical substance is considered to have a low potential for bioaccumulation if there are bioconcentration factors (BCF) or bioaccumulation factors (BAF) of less than 1,000 or there are equivalent or

terrestrial species pose the potential for elevated exposures to humans and other organisms via food chains. EPA estimates that the new chemical substance has low bioaccumulation potential based on hydrolysis. EPA estimates that the [claimed CBI] hydrolysis product has low bioaccumulation potential based on BCFBAF model result mitigated by expected metabolism. Although EPA estimated that the [claimed CBI] hydrolysis product could be persistent in anaerobic environments, the hydrolysis product has low potential for bioaccumulation, such that repeated exposures are not expected to cause food chain effects via accumulation in exposed organisms.

Human Health Hazard[5]: Human health hazard is relevant to whether a new chemical substance is likely to present an unreasonable risk because the significance of the risk is dependent upon both the hazard (or toxicity) of the chemical substance and the extent of exposure to the substance. EPA estimated the human health hazard of this chemical substance based on its estimated physical/chemical properties, data on the new chemical substance and analogous chemical substances, and other structural information. The new chemical substance falls within the TSCA New Chemicals Program Chemical Category of [claimed CBI]. Absorption of the new chemical substance is expected to be nil to poor through the skin due to the slow hydrolysis and physical/chemical properties and poor to moderate (with reaction) through the gastrointestinal tract and lungs based on physical/chemical properties. EPA identified developmental, reproductive, neurological, and blood effects as hazards based on [claimed CBI]. EPA identified developmental effects as hazards for the [claimed CBI] reaction products, which may form [claimed CBI] upon metabolism. EPA identified irritation and lung effect hazards due to the reactivity of the new chemical substance. Test data on the new chemical substance were negative for mutagenicity, skin irritation, and skin sensitization and positive for mild eye irritation. EPA identified a BMDL of 10.3 mg/kg/day for developmental effects in an oral developmental toxicity study on the inorganic acid component (non-guideline). A LOAEL of 100 mg/kg/day was identified for developmental effects in an oral developmental toxicity study on an analogue

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analogous data. A chemical substance is considered to be bioaccumulative if there are BCFs or BAFs of 1,000 or greater and less than or equal to 5,000 or there are equivalent or analogous data. A chemical substance is considered to be very bioaccumulative if there are BCFs or BAFs of 5,000 or greater or there are equivalent or analogous data. (64 FR 60194; November 4 1999)

[5] A chemical substance is considered to have low human health hazard if effects are observed in animal studies with a No Observed Adverse Effect Level (NOAEL) equal to or greater than 1,000 mg/kg/day or if there are equivalent data on analogous chemical substances; a chemical substance is considered to have moderate human health hazard if effects are observed in animal studies with a NOAEL less than 1,000 mg/kg/day or if there are equivalent data on analogous chemical substances; a chemical substance is considered to have high human health hazard if there is evidence of adverse effects in humans or conclusive evidence of severe effects in animal studies with a NOAEL of less than or equal to 10 mg/kg/day or if there are equivalent data on analogous chemical substances. EPA may also use Benchmark Dose Levels (BMDL) derived from benchmark dose (BMD) modeling as points of departure for toxic effects. See https://www.epa.gov/bmds/what-benchmark-dose-software-bmds. Using this approach, a BMDL is associated with a benchmark response, for example a 5 or 10 % incidence of effect. The aforementioned characterizations of hazard (low, medium, high) would also apply to BMDLs. In the absence of animal data on a chemical or analogous chemical substance, EPA may use other data or information such as from in vitro assays, chemical categories (e.g., Organization for Economic Co-operation and Development, 2014 Guidance on Grouping of Chemicals, Second Edition. ENV/JM/MONO(2014)4. Series on Testing & Assessment No. 194. Environment Directorate, Organization for Economic Co-operation and Development, Paris, France. (http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=env/jm/mono(2014)4&doclanguage=en)), structure-activity relationships, and/or structural alerts to support characterizing human health hazards.

of the potential [claimed CBI] metabolites (non-guideline). The BMDL and LOAEL values were used to derive exposure route- and population-specific points of departure for quantitative risk assessment, described below.

Environmental Hazard[6]: Environmental hazard is relevant to whether a new chemical substance is likely to present unreasonable risk because the significance of the risk is dependent upon both the hazard (or toxicity) of the chemical substance and the extent of exposure to the substance. EPA estimated environmental hazard of this new chemical substance using predictions based on the negligible water solubility of the substance and its hydrolysis product. The new chemical substance falls within the TSCA New Chemicals Program Chemical Category of Neutral Organics. Acute and chronic toxicity values estimated for fish, aquatic invertebrates, and algae are all no effects at saturation. These toxicity values indicate that the new chemical substance is expected to have low environmental hazard. Because hazards are not expected up to the water solubility limit, acute and chronic concentrations of concern are not identified.

Exposure: The exposure to a new chemical substance is potentially relevant to whether a new chemical substance is likely to present unreasonable risks because the significance of the risk is dependent upon both the hazard (or toxicity) of the chemical substance and the extent of exposure to the substance.

EPA estimates occupational exposure and environmental release of the new chemical substance under the intended conditions of use described in the PMN using ChemSTEER (Chemical Screening Tool for Exposures and Environmental Releases https://www.epa.gov/tsca-screening-tools/chemsteer-chemical-screening-tool-exposures-and-environmental-releases). EPA uses EFAST (the Exposure and Fate Assessment Screening Tool; https://www.epa.gov/tsca-screening-tools/e-fast-exposure-and-fate-assessment-screening-tool-version-2014) to estimate general population, consumer, and environmental exposures.

EPA considers workers to be a potentially exposed or susceptible subpopulation (PESS) on the basis of greater exposure potential compared to the general population. EPA also considers PESS in conducting general population drinking water exposures by evaluating risks associated with water intake rates for multiple age groups, ranging from infants to adults. EPA considers consumers of specific products to be a potentially exposed or susceptible subpopulation on the basis of greater exposure potential compared to the general population who do not use specific products.

[6] A chemical substance is considered to have low ecotoxicity hazard if the Fish, Daphnid and Algae LC50 values are greater than 100 mg/L, or if the Fish and Daphnid chronic values (ChVs) are greater than 10.0 mg/L, or there are not effects at saturation (occurs when water solubility of a chemical substance is lower than an effect concentration), or the log Kow value exceeds QSAR cut-offs. A chemical substance is considered to have moderate ecotoxicity hazard if the lowest of the Fish, Daphnid or Algae LC50s is greater than 1 mg/L and less than 100 mg/L, or where the Fish or Daphnid ChVs are greater than 0.1 mg/L and less than 10.0 mg/L. A chemical substance is considered to have high ecotoxicity hazard, or if either the Fish, Daphnid or Algae LC50s are less than 1 mg/L, or any Fish or Daphnid ChVs is less than 0.1 mg/L (Sustainable Futures https://www.epa.gov/sustainable-futures/sustainable-futures-p2-framework-manual).

For this new chemical assessment, EPA assessed exposure to workers via the inhalation and dermal routes. Releases to water and air were estimated. Exposure to the general population was assessed via drinking water and fish ingestion. Exposure to the general population via inhalation was not assessed because releases to air are expected to be negligible (below modeling thresholds). Exposures to consumers were not assessed because consumer uses were not identified as conditions of use.

Risk Characterization: EPA applies a margin of exposure approach to calculate potential human health risks of new chemicals. A benchmark (acceptable) margin of exposure is derived by applying uncertainty factors for the following types of extrapolations: intra-species extrapolation (UF_H = 10 to account for variation in sensitivity among the human population), inter-species extrapolation (UF_A = 10 to account for extrapolating from experimental animals to humans) and LOAEL-to-NOAEL extrapolation (UF_L = 10 to account for using a LOAEL when a NOAEL is not available). Hence, in the New Chemicals Program, a benchmark MOE is typically 100 and 1000 when NOAELs and LOAELs, respectively, are used to identify hazard. When allometric scaling or pharmacokinetic modeling is used to derive an effect level, the UF_H may be reduced to 3, for a benchmark MOE of 30. The benchmark MOE is used to compare to the MOE calculated by comparing the toxicity NOAEL or LOAEL to the estimated exposure concentrations. When the calculated MOE is equal to or exceeds the benchmark MOE, the new chemical substance is not likely to present an unreasonable risk. EPA assesses risks to workers considering engineering controls described in the PMN but in the absence of personal protective equipment (PPE) such as gloves and respirators. If risks are preliminarily identified, EPA then considers whether the risks would be mitigated by the use of PPE (e.g., impervious gloves, respirator).

Risks to human health for the new chemical substance were evaluated using the route-specific effect levels (i.e., BMDL and LOAEL) described above. Risks were not identified for workers for developmental effects via dermal exposure to the inorganic acid component (MOE = 305; benchmark MOE = 66). Risks were identified for workers for developmental effects via dermal exposure to the potential [claimed CBI] metabolites (MOE = 36; benchmark MOE = 1,000). Risks will be mitigated if exposures are controlled by the use of appropriate PPE, including impervious gloves. Risks were not identified for workers for developmental effects via inhalation exposure to the potential [claimed CBI] metabolites (MOE = 5,153; benchmark MOE = 1,000) or the inorganic acid moiety (MOE = 43,000; benchmark MOE = 66). Hazards that were identified for workers for irritation via the inhalation and dermal routes and lung effects via inhalation cannot be quantified due to a lack of dose-response information for these hazards. However, risks can be mitigated if exposures are controlled by the use of appropriate PPE, including impervious gloves and a respirator with APF 10. EPA expects that workers will use appropriate PPE (i.e., impervious gloves, respirator with APF 10), consistent with the Safety Data Sheet provided by the PMN submitter, in a manner adequate to protect them.

Risks were not identified for the general population for developmental effects from the inorganic acid component from oral exposure to drinking water (MOE_{Adult} = 1,600,000,000; MOE_{Infant} = 393,000,000; benchmark MOE = 66) or fish ingestion (MOE = 53,000,000; benchmark MOE = 66). Risks were not identified for the general population for developmental effects from the potential [claimed CBI] metabolites from oral exposure to drinking water (MOE_{Adult} = 195,000,000; MOE_{Infant} = 46,000,000; benchmark MOE = 1,000) or fish ingestion (MOE =

6,000,000; benchmark MOE = 1,000). Risks to consumers were not evaluated because consumer uses were not identified as conditions of use.

Risks to the environment from acute and chronic exposure are not expected at any concentration of the new chemical substance soluble in water (i.e., no effects at saturation).

Because worker exposures can be controlled by PPE, no unreasonable risks to the general population or environment were identified, and there are no expected consumer exposures, EPA has determined that the new chemical substance is not likely to present unreasonable risk to human health or the environment under the conditions of use.

3/15/19
Date:

/s/
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