TSCA Section 5(a)(3) Determination for Premanufacture Notice (PMN) P-17-0332

Number: P-17-0332
TSCA Section 5(a)(3) Determination: The chemical substance is not likely to present an unreasonable risk (5(a)(3)(C))

Chemical Name:
Generic: Benzenesulfonic acid, (alkenediyl)bis[[[(hydroxyalkyl)amino]-(phenylamino)-triazin-2-yl]amino]-, N-(hydroxyalkyl) derivs., salts

Conditions of Use (intended, known, or reasonably foreseen)[1]:
Intended conditions of use (specific): Manufacture in solution at a concentration of approximately [claimed CBI] and process to a concentration of approximately [claimed CBI] for industrial use as an optical brightener in paper applications, 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 could be very persistent, the chemical substance has low potential for bioaccumulation, such that repeated exposures are not expected to be cumulative. Based on test data on the new chemical substance and analogous chemical substances, EPA estimates that the chemical substance has moderate environmental hazard and low human health hazard. EPA determines that the new chemical substance is not likely to

[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.

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 using data on the new chemical substance and analogous chemicals. The chemical substance is expected to be removed with an efficiency of 0-25% during wastewater treatment due to low biodegradability, low sorption, and low stripping in addition to high water solubility. Sorption to soil and sediment is expected to be low and migration to groundwater is rapid based on high water solubility. Volatilization to air is expected to negligible because the substance is expected to have low vapor pressure and a low Henry's Law constant. Overall, these estimates are indicative of low potential for this chemical substance to volatilize into the air and a high potential for this chemical to migrate into groundwater.

Persistence[2]: 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. Based on data for analogous chemicals and large predicted molecular volume of the new chemical substance, EPA estimated the aerobic and anaerobic biodegradation half-lives to be greater than six months. These estimates for biodegradation indicate that the chemical substance may be very persistent in aerobic environments (e.g., surface water) and in anaerobic environments (e.g., sediment).

Bioaccumulation[3]: Bioaccumulation is relevant to whether a new chemical substance is likely to present an unreasonable risk because substances that bioaccumulate in aquatic and/or terrestrial species pose the potential for elevated exposures to humans and other organisms via food chains. The chemical substance has low bioaccumulation potential based on estimates from analogous chemicals and large predicted molecular volume, which limits bioavailability and bioaccumulation. Although EPA estimated that the new chemical substance could be very persistent, the chemical substance has low potential for bioaccumulation, such that repeated exposures are not expected to cause food chain effects via accumulation in exposed organisms.

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[2] 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)

[3] 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 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)

Human Health Hazard[4]: 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, submitted data on the new chemical substance, analogue data, and other structural information. Absorption of the new chemical substance is estimated, based on physical-chemical properties, to be nil through the skin as neat chemical and poor if in solution, moderate through the lungs and poor through the GI tract. Dermal absorption for a stilbene brightener with similar molecular weight is 0.084% in ethanol. Data for the new chemical substance include gene mutation and chromosomal aberration tests which were both negative. Data for an analogue, C.I. Fluorescent Brightener 28/113 is available in an OECD SIDS Initial Assessment Profile[5] and indicate: slight eye irritation in one of three tests; no indication of skin irritation, negative findings for skin sensitization in a guinea pig maximization assay, negative findings for mutagenicity, which are consistent with the negative findings for the new chemical substance. Repeated dose testing of the analogue include a 28-day oral study in rats; a 90-week dermal study in mice wherein no toxicity was observed; and two 2-year oral feeding studies in rats with C.I. Fluorescent Brightener 28/113. No carcinogenic potential was indicated in either of the long-term studies. EPA used the NOEL of 54.1 mg/kg-day based on body weight reduction from one of the 2-year oral dietary studies to derive exposure route- and population-specific points of departure for quantitative risk assessment.

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

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[4] 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.

[5] OECD SIDS document for C.I. Fluorescent Brightener, SIAM 20, 2005. (https://hpvchemicals.oecd.org/ui/handler.axd?id=94d334d9-224f-4fa4-9341-d2825ddbd342)

[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

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 based on data for an analogous substance. Acute toxicity values for fish (LC_{50}) and algae (EC_{50}) estimated from the analogue are >1000 mg/L and the acute daphnid toxicity value (LC_{50}) is > 100 mg/L. Chronic toxicity values for the analogue are > 100 mg/L for fish, 6.59 mg/L for daphnia and 707 mg/L for algae. These toxicity values indicate the new chemical substance is expected to have moderate hazard. Application of assessment factors of 5 and 10 to acute and chronic toxicity values results in estimated acute and chronic concentrations of concern of 20 mg/L (20,000 ppb) and 0.659 mg/L (659 ppb), respectively.

Exposure and Risk Characterization: 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 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 and environmental exposures. For this new chemical, EPA assessed exposure via dermal route to workers during processing (inhalation exposure to workers under the conditions of use are not expected) and exposure to the general population via drinking water.

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 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).

ChVs is less than 0.1 mg/L (Sustainable Futures https://www.epa.gov/sustainable-futures/sustainable-futures-p2-framework-manual).

Risks to human health for the new chemical substance were evaluated using the route-specific effect levels (i.e., NOEL) described above. The exposures predicted under the intended conditions of use are not expected to present unreasonable risk because the MOEs calculated exceeded the benchmark MOEs (100 for inhalation, dermal and oral exposures). EPA did not identify risk to workers for systemic toxicity from dermal exposure because the MOE (6,786); exceeded the benchmark MOE of = 100). EPA did not identify risk to the general population for systemic effects from oral exposure to drinking water because the MOEs (MOE_{Adult} = 12, 729; MOE_{Infant} = 3,031) exceeded the benchmark MOE of 100.

Risks to the environment were evaluated by comparing estimated surface water concentrations under the conditions of use described in the PMN with the estimated acute and chronic COCs of 20,000 ppb and 659 ppb, respectively. EPA did not identify risk to the environment because the estimated maximum acute and chronic surface water concentrations did not exceed the acute or chronic COCs.

Potentially Exposed or Susceptible Subpopulation(s) (PESS): EPA considers workers to be a PESS on the basis of greater exposure potential compared to the general population. EPA has assessed risks to workers under the conditions of use of the new chemical substance and concludes that workers are not expected to be exposed to the new chemical substance at levels that would present an unreasonable risk. 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. Using this approach, no unreasonable risks were identified for the general population for any life stage, as the calculated MOEs exceeded the benchmark MOE. 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. Risks to consumers were not evaluated because consumer uses were not identified as intended or reasonably foreseen.

9/18/18
Date:

/s/
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