

Initial Risk-Based Prioritization of High Production Volume Chemicals

Aluminum Alkyls Category

Aluminum triethyl	(CAS No. 97-93-8)
Aluminum chlorodiethyl	(CAS No. 96-10-6)
Aluminum tri isobutyl	(CAS No. 100-99-2)
Aluminum dichloroethyl	(CAS No. 563-43-9)
Aluminum tri n-octyl	(CAS No. 1070-00-4)
Aluminum tributyl	(CAS No. 1116-70-7)
Aluminum trihexyl	(CAS No. 1116-73-0)
Aluminum tri (C2 – C20) alkyls*	(CAS No. 68908-97-4)
Aluminum trichloro triethylidi	(CAS No. 12075-68-2)
Aluminum diisobutyl chloride	(CAS No. 1779-25-5)

*Mixture containing the following 14 components

Aluminum tridodecyl	(CAS No. 1529-59-5)
Aluminum tritexadecyl	(CAS No. 1726-65-4)
Aluminum tris (decyl)	(CAS No. 1726-66-5)
Aluminum trioctadecyl	(CAS No. 3041-23-4)
Aluminum tridocosyl	(CAS No. 6651-25-8)
Aluminum tritetracosyl	(CAS No. 6651-26-9)
Aluminum trioctacosyl	(CAS No. 6651-27-0)
Aluminum trihexacosyl	(CAS No. 10449-71-5)
Aluminum triethyl	(CAS No. 97-93-8)
Aluminum tributyl	(CAS No. 1116-70-7)
Aluminum trihexyl	(CAS No. 1116-73-0)
Aluminum trioctyl	(CAS No. 1070-00-4)
Aluminum trieicosyl	(CAS No. 1529-57-3)
Aluminum tritetradecyl	(CAS No. 1529-58-4)

This document is based on screening-level characterizations done by EPA on the environmental fate, hazard, and exposure of the listed chemicals. The information used by EPA includes data submitted under the HPV Challenge Program¹ and the 2006 Inventory Update Reporting (IUR)², and data publicly available through other selected sources³. This screening-level prioritization presents EPA's initial thinking regarding the potential risks presented by these chemicals and future possible actions that may be needed. These initial characterization and prioritization documents do not constitute a final Agency determination as to risk, nor do they determine whether sufficient data are available to characterize risk. Rather, they are interim evaluations. Recommended actions may be considered by EPA in the future based on a relative judgment regarding this chemical in comparison with others evaluated under this program, and in light of the uncertainties presented by gaps in the available data that may be determined to exist. These evaluations contribute to meeting U.S. commitments under the chemicals cooperation work

¹ US EPA, HPV Challenge Program information: <http://epa.gov/hpv/>.

² US EPA, IUR Reporting information: <http://www.epa.gov/oppt/iur/index.htm>.

³ US EPA, Information on additional public databases used: <http://www.epa.gov/hpvis/pubdtsum.htm>.

being done in North America⁴ through the EPA Chemical Assessment and Management Program (ChAMP)⁵.

Hazard and Fate Summary:

- **Human Health:** No mammalian toxicity data are available because these chemicals react too violently with air and water to be tested. Based on strong reactivity of these chemicals with water, these compounds are expected to cause severe thermal burns to the eye and skin, with risk of explosion during test substance administration via inhalation. These chemicals are considered highly hazardous at the point of contact.
- **Environment:** No aquatic toxicity data are available because these chemicals react too violently with water to be tested. Based on extreme reactivity, the chemicals in this category have the potential to be highly hazardous to an organism at the point of contact.
- **Persistence and Bioaccumulation:**
 - Category members react immediately and spontaneously with air and water, and thus are not persistent.
 - Bioaccumulation potential is ranked low because of reactivity.

Exposure Summary:

- Both Confidential Business Information (CBI) and non-confidential information from IUR and other sources were used in developing this initial prioritization.
- **Production Volume:** The ranges reported below are based on 2006 IUR submissions.
 - Seventeen category members are HPV chemicals:
 - CAS No. 97-93-8: ≥ 50 million and < 100 million lbs.
 - CAS Nos. 1070-00-4, 1116-70-7, 1116-73-0, 1529-57-3, 1529-58-4, 1529-59-5, 1726-65-4, 1726-66-5, 3041-23-4, 12075-68-2: ≥ 10 million and < 50 million lbs.
 - CAS Nos. 96-10-6, 100-99-2, 563-43-9, 6651-25-8, 6651-26-9, 10449-71-5: ≥ 1 million and < 10 million lbs.
 - One category member is a moderate production volume (MPV) chemical:
 - CAS No. 6651-27-0: $\geq 500,000$ lbs and < 1 million lbs.
 - Two category members did not have IUR submissions in 2006:
 - CAS Nos. 1779-25-5 and 68908-94-4.
- **Uses:** Non-confidential IUR information for many of the chemicals in this category indicates that they are used as intermediates in manufacturing other basic organic chemicals. Information submitted as part of the HPV Challenge Program indicates that these chemicals are highly reactive materials that are used in a variety of industrial chemical processes such as polymerization, oligomerization, alkylation, and stereochemical synthesis. Correspondence concerning IUR submissions indicates that these chemicals would not continue to exist in products produced through these processes because they are fully reacted.
- **General Population and Environment:** Based on the extremely high reactivity that dictates enclosed processes for these chemicals, EPA identifies a low potential that the

⁴ US EPA, U.S. Commitments to North American Chemicals Cooperation:
<http://www.epa.gov/hpv/pubs/general/sppframework.htm>.

⁵ US EPA, ChAMP information: <http://www.epa.gov/champ/>.

general population and the environment might be exposed, absent a major accidental release.

- Workers: Based on all available information, EPA identifies a low relative ranking for potential worker exposure for all of the chemicals in this category. Because these chemicals are highly flammable and reactive with both oxygen and water, EPA considers that these chemicals or mixtures containing these chemicals would need to be handled in equipment that would minimize contact with air (e.g. under nitrogen blanket) and therefore substantially reduce the potential for worker exposure under routine plant operations. None of these chemicals currently have OSHA Permissible Exposure Limits (PELs).
- Consumers: EPA identifies a low potential that consumers might be exposed because these chemicals are not in consumer products.
- Children: EPA identifies a low potential that children might be exposed.

Risk Characterization Summary:

There is no toxicity information available on these chemicals due to their high reactivity with water and air. Their strong reactivity and high flammability make the category members highly hazardous at the point of contact. Therefore, potential exposures are mitigated under routine plant operations through the use of enclosed processes and by minimizing contact with air and water. This lack of exposure suggests a low concern for potential risks to all populations.

- Potential Risk to Aquatic Organisms from Environmental Releases: *LOW CONCERN*.
- Potential Risk to the General Population from Environmental Releases: *LOW CONCERN*.
- Potential Risk to Workers: *LOW CONCERN*. These chemicals present extreme physical hazards in the workplace because of their flammability and high reactivity with water and air. In addition, some members of the category degrade to highly acutely toxic substances upon contact with air and water. However, EPA considers that these hazards would be mitigated under routine plant operations through the use of enclosed processes that substantially reduce the potential for worker exposures, which suggests a low concern for potential risk.
- Potential Risk to Consumers from Known Uses: *LOW CONCERN*.
- Potential Risk to Children: *LOW CONCERN*.

Regulatory and Related Information Summary:

- The aluminum alkyl category chemicals are listed on the TSCA Inventory. They are not otherwise regulated under TSCA.
- In 2005, EPA added 10 chemicals in this category to the list of chemicals in 40 CFR 710.46 for which processing and use information is not required under IUR because exposure to these substances is not likely to occur due to their high and apparent reactivities, which require the use of preventive measures when handling the substances in order to eliminate the possibility of exposure or release. Accordingly, these chemicals were deemed to be of low current interest. (70 FR 74696, December 16, 2005).
- It is generally recognized that the nonhalogenated alkyls may decompose to aluminum oxide fumes and the halogenated alkyls cause even greater irritation as they decompose

to halogenated acid fumes⁶. For aluminum (soluble salts and alkyls, as Al), the NIOSH REL is a 10-hour TWA of 2 mg/m³, and a 1988 OSHA PEL was established as an 8-hour TWA of 2 mg/m³. Although the court vacated the 1988 OSHA PELs, exceeding them could be recognized as a violation under the “General Duty Clause” of Section 5(a)(1) of the OSH Act.

Assumptions and Uncertainties:

- As noted, these chemicals are too reactive to test for toxicity and must be handled in closed processes in order to be used safely. EPA accordingly assumes that exposures and releases are unlikely under routine plant operations. EPA has not assessed accidental releases.

Rationale Leading To Prioritization Decision:

- The physical hazards associated with these chemicals are well known. Exposures and releases are already strictly controlled in order to minimize what would otherwise be a high risk of death or injury from fire or explosion presented by these chemicals. Given the existing controls, further action by the Agency is not contemplated.

Prioritization Decision:

- LOW PRIORITY – Follow-up action not suggested at this time.

Supporting Documentation:

Screening-Level Risk Characterization: July 2008

Screening-Level Hazard Characterization: July 2008

Screening-Level Exposure Characterization: July 2008

⁶ Aluminum Alkyls Consortium, 2001. Categorization of Aluminum Alkyls. Accessed at: <http://www.epa.gov/hpv/pubs/general/sppframework.htm>.