

## Initial Risk-Based Prioritization of High Production Volume Chemicals

### Chemical/Category: Dicarboxylic Acids Category

CAS No. 110-15-6 Succinic Acid (Butanedioic acid)

CAS No. 110-94-1 Glutaric Acid (Pentanedioic acid)

CAS No. 124-04-9 Adipic Acid (Hexanedioic acid)

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 Program<sup>1</sup> and the 2006 Inventory Update Reporting (IUR)<sup>2</sup>, and data publicly available through other selected sources.<sup>3</sup> 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 being done in North America.<sup>4</sup>

### Human Health and Environmental Hazard Summary:

- Available data indicated low toxicity to humans. Succinic acid is a severe eye irritant. Adipic acid is a moderate eye irritant and glutaric acid is an eye irritant. Repeated exposures via oral route affected body weight and body weight gains at higher doses.
- Available data indicates the potential acute hazard of category members to aquatic organisms is low.

### Persistence and Bioaccumulation Summary:

- Available data indicate category members are not persistent.
- Available data indicate category members are not bioaccumulative.

### Exposure Summary:

- Both IUR Confidential Business Information (CBI) and non-CBI information from IUR and other sources were used in developing this initial prioritization.
- Production volume: All category members are HPV chemicals (manufactured or imported in excess of 1 million pounds per year).
- Uses: Glutaric and succinic acids are by-products produced from the manufacturing of adipic acid. Succinic acid is used in the manufacture of lacquers, dyes, esters for perfumes, in photography, and in foods. Glutaric acid is used in organic synthesis of chemical intermediates for polymers, for its esters and anhydride, for human and

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

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

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

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

veterinary medication. Adipic acid is an industrial intermediate used for the production of Nylon 6, 6 for use in fibers, engineering resins, films, and monofilaments. Other uses include flue gas desulphurization, and adhesives, and it is recognized as a Generally Recognized as Safe or (GRAS) substance by the U.S. Food and Drug Administration.

- General Population and Environment: The three chemicals are not reported on the Toxics Release Inventory (TRI). Based on use information, EPA assumes for the purpose of this risk prioritization that there is potential for exposures to the general population and the environment.
- Workers: No OSHA Permissible Exposure Limits have been set for members of this category. Because the vapor pressure of category members is very low, inhalation of vapors is likely to be limited. However, there is potential for other exposures to all three category members. Production volume and estimated numbers of workers for adipic acid are much higher than either succinic or glutaric acids. Based on IUR data, specifically the number of potentially exposed workers and use codes, the ranking for potential worker exposure is high for all three category members.
- Commercial Workers and Consumers: IUR information suggests that the chemicals in this category will be used in consumer/commercial products. Depending on the product, consumers may have potential dermal and inhalation exposure to the chemical.
- Children: IUR information suggests that both glutaric and succinic acid either will not be used in children's consumer products or that this type of information is not readily available. Thus, there is a moderate likelihood that these chemicals are used in products intended to be used by children but there is uncertainty in the IUR data. IUR information indicates that adipic acid will be used in products intended for use by children; and depending on the product, children may have potential dermal and inhalation exposure to the chemical.

#### **Assumptions and Uncertainties:**

- Minor uses are not reported under the IUR, and are thus unknown.
- Professional judgment and overall chemical usage patterns suggest that the concentration of succinic acid in commercial or consumer products is likely to be too low to cause concern for most health effects, including eye irritation directly attributable to succinic acid.

#### **Risk Characterization Summary:**

- *Potential Risk to Aquatic Organisms from Environmental Releases (LOW CONCERN)*: EPA assumes there is potential for exposure to aquatic organisms from environmental releases. The low acute aquatic hazard and the overall environmental fate characteristics (not persistent or bioaccumulative) of all members of the dicarboxylic acids category suggest a low concern for potential risk to aquatic organisms from environmental releases.
- *Potential Risk to the General Population from Environmental Releases (LOW CONCERN)*: EPA assumes there is potential for exposure to the general population from environmental releases. The low human health hazard due to the lack of specific toxicity to animals following exposure to high doses and the overall environmental fate characteristics of the category members (as described above) suggest a low concern for potential risk to the general population from environmental releases.

- *Potential Risk to Workers (LOW CONCERN):* Worker exposures, from particulate matter, to all three category members are likely. The available hazard data suggest a low hazard due to the lack of any specific toxicity to animals following exposures to high doses. There is potential for eye irritation for two category members (severe irritation for succinic acid and moderate irritation for adipic acid). Although there is no OSHA PEL for any category member, acute irritation effects are considered reversible and self-limiting in that professionals would notice them quickly and either protect themselves with appropriate protective equipment or remove themselves from the exposure. Also, hazard communication and standard industrial hygiene practices, if properly followed, may be sufficient to address this concern. Thus, the information suggests a low concern for potential risk to workers.
- *Potential Risk to Commercial Workers and Consumers from Known Uses (LOW CONCERN):* All three category members are reported to be in products used by commercial workers and consumers, although the information suggests higher exposures to adipic acid are likely (via the use of Nylon; although the adipic acid is bound in the product and not released). However, the available hazard data show that all category members have low and non-specific toxicity. Thus, the information suggests a low concern for potential risk to commercial workers/consumers.
- *Potential Risk to Children (LOW CONCERN):* Two of the category members (succinic and glutaric acid) are not likely to be found in commercially available products available to children. One (adipic acid) of the three category members has a different use profile and is used in products intended for use by children. However, the hazard profile shows that all category members have low and non-specific toxicity and there is no indication of adverse effects on reproduction or development following exposure to high doses in available animal studies. Thus, the information suggests a low concern for potential risk to children.

**Rationale Leading To Prioritization Decision:**

- Members in the category are of low toxicity and of low risk concern.
- Since they are mild to severe eye irritants and can also be skin irritants, workers should be made aware of these hazards and use appropriate personal protective equipment (PPE); however, it is not expected that these chemicals would be present in consumer products in either sufficient quantities or a form that would cause severe irritation.

**Prioritization Decision:**

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

**Supporting Documentation:**

**Screening-Level Risk Characterization: 3/13/2008**  
**Screening-Level Hazard Characterization: 2/25/2008**  
**Screening-Level Exposure Characterizations: 3/14/2008**