



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D.C. 20460

OFFICE OF
PREVENTION, PESTICIDES
AND TOXIC SUBSTANCES

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MEMORANDUM

Subject: Data Package D315790
Benzoic Acid New Chemical Screen

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12/8/05

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BACKGROUND

Petro-Canada wishes to register technical grade benzoic acid, 99.93% purity. Benzoic acid is a New Chemical active ingredient. Petro-Canada wishes to rely on acute toxicity data support for sodium benzoate in support of benzoic acid.

In a March 30, 2005 meeting between Petro-Canada and Antimicrobials Division representatives, the consensus opinion regarding acute toxicity data support was that new data for benzoic acid would most likely not be needed. It was thought that Petro-Canada could most likely rely on sodium benzoate data, either in general or at least in regard to acute oral toxicity.

DISCUSSION

A summary of available information on the toxicological effects of benzoic acid and sodium benzoate is found in a September 25, 2003 Health Effects Division (HED) document "Benzoic Acid and Benzoate salts: Health Effects Division Science Assessment Document for Tolerance

Reassessment." Regarding the similarity between the two chemicals, the HED document states that "it was considered that data gaps for one benzoate salt could be adequately addressed by the existing data for the other benzoate compounds. Benzoic acid and its salts are rapidly absorbed by mammals, conjugated with glycine, and rapidly excreted in the urine as hippuric acid."

The HED document also lists study results and their corresponding acute Toxicity Categories for benzoic acid and, where available, for sodium benzoate. Acute effects for which the Toxicity Categories are listed for both chemicals are acute oral toxicity, eye irritation, skin irritation, and skin sensitization. For these effects, with the exception of eye irritation, the Categories are in general agreement between the two chemicals, with benzoic acid showing slightly greater acute effect where there is a difference. For eye irritation, benzoic acid data showed severe irritation whereas sodium benzoate was non-irritating. This is not too surprising, however, since eye irritation is a particularly variable acute effect, from one substance to another. (Appropriately, the label for the proposed benzoic acid product indicates severe eye irritation.) Data for the other two acute effects -- acute dermal and acute inhalation toxicity -- are available for benzoic acid itself (though not necessarily for sodium benzoate).

Other study results and human effects information cited in Hazardous Substances Data Bank (HSDB, available at <http://toxnet.nlm.nih.gov>) and elsewhere help attest to the acute oral toxicity Category III rating for the two chemicals and also suggest that benzoic acid itself, though irritating, is not expected to be corrosive to the eye, respiratory tract, or mucous membranes.

RECOMMENDATION

Based on the similarity between sodium benzoate and benzoic acid, and based on the acute toxicity data summaries for both chemicals in the above-referenced HED document, it can be reasonably concluded that no further acute toxicity data is needed for the registration of technical grade benzoic acid. (This, however, does not apply to future registrations of formulations or dilutions, which will need to be supported by their own product-specific data or by cited data conducted on similar products.) Concerns about data gaps -- acute dermal and acute inhalation toxicity -- for sodium benzoate are allayed by the availability of such data for benzoic acid itself. Additionally, the above-cited data support in general appears consistent with information cited in Hazardous Substances Data Bank and elsewhere regarding these chemicals' effects in humans.

The acute Toxicity Categories listed in the above-referenced HED document for benzoic acid are as follows:

Acute oral toxicity	III
Acute dermal tox.	III (as worst case based on a limit test)
Acute inhalation tox.	IV
Eye irritation	I
Skin irritation	III
Skin sensitization	Non-sensitizing

Based on the above acute Toxicity Categories, the proposed product label (version "12/1/2004 Draft") should be revised in accordance with the Label Review Manual as follows:

1. Change the signal word "CAUTION" to read "DANGER".
2. Add the statement "Harmful if absorbed through skin" (or add "if absorbed through skin" to the "Harmful if swallowed" sentence).

The term "Corrosive" need not be required on the label, since benzoic acid does not appear to be corrosive to the eye. (References: <http://www.inchem.org/documents/cicads/cicads/cicad26.htm>, <http://toxnet.nlm.nih.gov/cgi-bin/sis/search/f?./temp/~ws8XTG:1> .)

The applicant-proposed *If Swallowed* portion of the First Aid section includes the statement "Do not give any liquid to the person." Whereas, the usual statement as per the Label Review Manual is "Have person sip a glass of water if able to swallow." However, the applicant may use the proposed statement if the applicant considers it medically preferable.

Products placed in Toxicity Category I for eye irritation must normally include the following "Note to Physician" statement near the First Aid section: "Probable mucosal damage may contraindicate the use of gastric lavage." However, mucosal damage from benzoic acid is not expected, and the statement need not be required in this case unless the applicant considers it appropriate.