



September 16, 2003

Dr. Scott A. Masten
Office of Chemical Nomination and Selection
NIEHS / NTP
Post Office Box 12233, MD A3-07
111 T.W. Alexander Drive
Research Triangle Park, NC 27709

re: Nomination of Cadmium Telluride for Toxicological Studies

Dear Dr. Masten:

The International Cadmium Association (ICdA) is the trade association representing the interests of the cadmium industry throughout the world. Its membership includes producers, recyclers, processors, converters, consumers and distributors of cadmium metal, cadmium compounds, and cadmium-containing products. These products include nickel-cadmium batteries; cadmium-pigmented plastics, glasses, ceramics, enamels and artists' colors; cadmium coatings for corrosion protection combined with low electrical resistance and low coefficient of friction; cadmium weathering and ultraviolet light stabilizers for polyvinyl chloride (PVC); cadmium alloys for brazing, soldering, electrical contact and electrical and thermal conductivity applications; and cadmium electronic compounds such as CdS, CdSe and CdTe which have unique semi-conducting and other electronic properties.

The International Cadmium Association whole-heartedly supports the nomination of CdTe by the Brookhaven National Laboratory and the U.S. Department of Energy for toxicological studies by the National Toxicology Program. Most of the toxicological information on cadmium has been gathered utilizing cadmium chloride, one of the most soluble of the cadmium salts. Cadmium telluride, as well as many of the other commercially utilized cadmium salts such as cadmium sulfide, cadmium selenide, cadmium oxide and cadmium hydroxide are much less soluble. Cadmium telluride and cadmium sulfide, in fact, the two cadmium-bearing materials present in CdTe solar cells, are generally regarded as being virtually insoluble in water at room temperature. Most carcinogenicity classifications of cadmium (IARC, ACGIH, NTP) clearly state that it is the ionic species of cadmium which is regarded as a probable or known human carcinogen, and not the insoluble compound. Therefore, ICdA welcomes studies which definitively establish the carcinogenicity and other toxicological properties of specific cadmium compounds, and thereby do not automatically default to the toxicological properties established for the highly soluble cadmium chloride and the ionic species of cadmium.



In addition, ICdA would like to bring to the attention of the National Toxicology Program the recent review on the issue of cadmium and lung and prostate cancer (Violaine Verougstraete, Dominique Lison and Philippe Hotz, "Cadmium, Lung and Prostate Cancer: A Systematic Review of Recent Epidemiological Data," *Journal of Toxicology and Environmental Health*, Part B, 6:227-255, 2003). These researchers at the Catholic University of Louvain in Belgium were part of the team which conducted the recently completed risk assessment on cadmium and cadmium oxide for the European Union. This review strongly suggests that the confounding effects of co-exposures in epidemiological studies have not adequately been taken into effect and that the previous classifications of cadmium as a known or suspected human carcinogen may have been overstated. Co-exposures specifically mentioned were PAHs, silica, asbestos, arsenic and smoking. In this regard, the International Cadmium Association feels that particularly careful attention must be paid to the results of Sorahan's studies at the University of Birmingham, especially the 1997 reference (*Occup. Environ. Med.* 54:194-201) which appears to contradict the earlier Thun et al. studies on which the OSHA and IARC carcinogenicity classifications were largely based. We would be happy to provide a copy of the Verougstraete, Lison and Hotz article if it is not readily available to you in the open literature.

Finally, the International Cadmium Association would like to add that it has been working with the nickel-cadmium (NiCd) battery industry on an international basis since 1985 to establish and promote the collection and recycling of NiCd batteries, and thus prevent their discard into the environment. We have similarly been involved with Brookhaven National Laboratory, the National Renewable Energy Laboratory, and several CdTe photovoltaic manufacturers to encourage the development and implementation of recycling technology for CdTe photovoltaic modules. We are pleased and impressed with the progress the photovoltaic industry has made in this regard, and will continue to cooperate with them to encourage the collection and recycling of CdTe solar cells.

The International Cadmium Association hopes that these comments are helpful and that the National Toxicology Program will pursue the proposed evaluation of the toxicological properties of cadmium telluride.

Sincerely yours,

Hugh Morrow, President
North American Office