Butanenitrile, 2,2'-azobis(2-methyl) - Comments of Environmental Defense

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Environmental Defense appreciates this opportunity to submit comments on the Robust Summary/Test Plan for Butanenitrile, 2,2'-azobis(2-methyl), CAS # 13472-08-7.

Butanenitrile, 2,2'-azobis(2-methyl) (AMBN) and propanenitrile, 2,2'-azobis(2-methyl) (AIBN) are structurally very similar and find similar uses. According to the sponsor, they are used exclusively in industrial applications, primarily as free radical initiators for chemical reactions e.g. polymerization. No consumer or environmental exposure is expected in the absence of a spill. Should a spill or release from production or use facilities occur, the significant water solubility and low volatility of AMBN should limit associated human health and environmental risks given its apparently moderate toxicity (as discussed below). Occupational exposure to AMBN should be limited by its low volatility and enforcement of appropriate industrial hygiene standards.

Data describing SIDS elements for AMBN are limited but those for AIBN are complete and have been previously evaluated through the Organization of Economic Cooperation and Development (OECD) high production volume program. Thus, since the chemical structures of these compounds differ by only one carbon atom, data for AIBN were submitted with those for AMBN for comparison and bridging purposes. The test plan for AMBN calls for additional physical and chemical data to be developed and proposes to use these data to support a re-run of computer models to predict the environmental fate of AMBN. Ecotoxicity data and mammalian toxicity data have not been developed for AMBN and additional work is not proposed. Rather it is proposed that these SIDS elements will be addressed by bridging from data developed AIBN. Following our review of the Test Plan and Robust Summary for AMBN and the accompanying data for AIBN we consider this approach acceptable.

Note:
Though not a required SIDS element the Test Plan offers a paragraph speculating on the mammalian metabolism of AMBN. The potential pathways for metabolism are appropriate, but may not be complete and may not account for the primary route of metabolism or the primary metabolites formed. In addition to the anticipated pathways that lead to oxidation of AMBN methyl groups to primary alcohols by hepatic enzymes, AMBN may also be metabolized by intestinal microbes. Metabolism by intestinal microbes would likely involve azo-reduction to form butanenitrile. Butanenitrile has not, to our knowledge, been the subject of appreciable toxicological characterization. However, a closely related compound, acetonitrile, has been studied extensively. Acetonitrile has appreciable and somewhat unique toxicity, but does not persist in the environment and is neither a mutagen nor a carcinogen. Thus, these endpoints are unlikely to be of concern for AMBN or its metabolites. However, occupational exposure to acetonitrile has resulted in serious adverse health effects. Thus, it would be of interest to reviewers of this Test Plan to include the possibility of metabolism of AMBN to butanintrile and a brief summary of toxicity data developed for acetonitrile. It would be even better if the appropriate metabolism studies were conducted and the resulting data described.

Thank you for this opportunity to comment.

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