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Comments on:
Abridged Alternatives Analysis Report on Two-component Low- and High-pressure Spray Polyurethane Foam Systems Containing Unreacted Methylene Diphenyl Diisocyanate, submitted to CA DTSC August 23, 2019 by Gradient for American Chemistry Council, Center for the Polyurethanes Industry, and Spray Foam Coalition.

Comments submitted to:
Safer Consumer Products Information Management System (CALSAFER), Department of Toxic Substances Control (DTSC), https://calsafer.dtsc.ca.gov/cms/commentpackage/?rid=12744

Introduction

The Massachusetts Toxics Use Reduction Institute (TURI) provides these brief comments based on our experience with alternatives assessment and with toxics use reduction. Please note that we have commented on a small selection of topics, and that our comments are not comprehensive in any way.

Background: Massachusetts Toxics Use Reduction Act (TURA)

TURA requires large-quantity chemical users in the state to report annually on their use of toxic chemicals, pay an annual fee, and conduct toxic use reduction (TUR) planning every two years. In the TUR planning process, businesses examine opportunities to reduce toxic chemical use by adopting safer processes or inputs.

The TURA program works from a number of core principles[1]:

- *Focus on use.* The TURA program focuses on identifying the reasons why chemicals are used and wastes are generated. The focus is on protecting human and environmental health by reducing or eliminating the use of toxics wherever possible.
- *Focus on hazard.* TURA focuses on reducing or eliminating toxic or hazardous chemicals. There is no requirement to prove that exposure will occur, or to calculate risk, in order to take action to eliminate or reduce a hazard.
- *Protection of workers, consumers, and the environment.* TURA's mandate is not only to prevent ambient environmental exposures resulting from industrial emissions, but also to take worker and consumer exposures into account.

- *Avoiding risk shifting.* TURA is intended to avoid risk shifting among environmental media or among groups of people.

General principles of alternatives assessment

In general, alternatives assessments are designed to include consideration of the full range of alternatives to a process or product, ranging from drop-in substitutes to adoption of safer technologies or processes. We understand that the responding entities may have been limited in part by the narrow focus of the priority product profile. However, it is important not to lose sight of the larger picture: safer alternatives exist for many applications of polyurethane spray foam, and adoption of those safer alternatives wherever practicable would help to protect workers and the public from preventable disease and disability. In TURI's work to assess alternatives, we are careful not to limit the discussion to a single technology; rather, we begin with a broad consideration of the cases in which the material is used and the full range of alternative products and processes that are available.

Confidential business information

The responding entities have noted limitations due to Safety Data Sheets (SDSs) not being available. It is not clear to us why a full SDS would be subject to CBI protections. We would expect that if necessary, the SDS could be redacted to remove customer information, for example, and could be reviewed. In order to complete a valid hazard assessment as part of a broader alternatives assessment, it is necessary to obtain and take account of any available hazard and constituent information.

Assessment of acceptable/technically feasible alternatives

We were surprised that the assessment of acceptable/feasible alternatives was rather limited. Many of the responsible entities are themselves formulators. Therefore, it is not clear why the search for alternatives was limited to existing formulations.

Commercial availability was a determining factor in the applicant's conclusion regarding "no viable alternative formulations." However, the responsible entities limited themselves to commercially available formulations. That is a useful first pass to determine availability of feasible alternatives, and if satisfactory alternatives are identified that are already commercially available, there may be no need for additional work. However, the majority of informed substitutions require deeper engagement and additional work to communicate with suppliers, researchers and other content experts.

The responsible entities appear to have relied upon simple internet searches of product specifications, supplemented by a search of patents for available documentation. This superficial level of research would miss what is likely a rich set of innovative solutions being developed by some of the RE's. For example, two patents identified are from Dupont, a member of the

applicant consortium and a company that is widely recognized for its innovative materials research. At a minimum, additional information could have been provided on these products.

In addition, information on the timing of commercial availability would be useful. Commercial availability is dynamic, and is often determined by market demand. If the formulation can or will be available within weeks, months, a year, or more, for example, this information should be included.

In summary, a dichotomous statement of "alternatives available" or "not available" is oversimplified. There is an important middle ground in which additional time and investigation are needed to demonstrate feasibility/viability. We have found that this type of information is especially helpful to supply chains. In TURI's experience, more information of this kind would be necessary to determine if further assessment was warranted (e.g., moving from an abridged to a full assessment).

Exposure potential

The focus on inherent hazard is an essential aspect of the CA priority product regulatory process. Given the use scenarios for the product in question, is it not clear that there can be an alternative with zero exposure potential.

From TURI's perspective, whenever a toxic chemical is used, there is the potential for adverse impacts on human health and the environment. The RE's note that "The California SCP regulations (and AA in general) do not allow for the consideration of risk (*i.e*., adjusting hazard for exposure potential) in making decisions about selecting alternative products (CalDTSC, 2013)." Adherence to this core principle is essential to completing a valid alternatives assessment process.

Hazard evaluation

The California Consumer Products regulation requires a life cycle approach when considering the hazards of the priority product and candidate alternatives. A hazard assessment of the individual ingredients in a formulation is the only approach currently available to understand the toxicity of a formulated product considering the lifecycle of manufacture, use and disposal.

The title of Table 5.1 states, "Does Not Represent Hazard or Risk Associated with Final Product(s)". This wording is misleading since the final products are not tested for hazard. In addition, the wording introduces the concept of risk, which is not the focus of the assessment. It is important to be clear that ingredient information is the source for understanding inherent hazard.

In addition, the display of hazard information in Table 5.1 is problematic. For example, it is well known that sensitization is one the primary health outcomes of concern for MDI. However, this endpoint is not mentioned in the applicant's table of Group A endpoints. Pharos includes sensitization as an endpoint, so it is very unclear why this key health endpoint was omitted. The

responding entities have noted sensitization in the review of GHS classifications, but have not organized the information in a way that highlights this important hazard or shows how the alternatives compare to one another.

While we recognize the challenge of summarizing toxicity information in a summary table, noting whether a hazard endpoint was "discussed" or "not discussed" in the Hazardous Substances Data Bank (HSDB) is not informative. If the toxicity of a given endpoint is described in HSDB, it should be characterized in the assessment. Simply mentioning that a database "discusses" an endpoint is not sufficient and would not, in general, be considered a good faith effort to assess hazard.

The responding entities also state there are "data gaps" in cases in which information is readily available. For example, a google search of "aquatic toxicity and MDI" shows multiple citations/sources for this information.[1] We have not fact checked all of the entries, but on a first pass, they do appear to be incomplete.

More generally, the hazard assessment is organized by information source, not endpoint. It would be more useful to understand a summary of the hazard assessment by endpoint. In some cases, use of some color coding, rather than simple listing of the classifications, might also be helpful to support comparisons. In addition, it is surprising that the consortium did not conduct a supplemental literature review (beyond noting that HSDB "discussed" an endpoint of interest). In TURI's experience, additional literature reviews are especially necessary when evaluating novel materials, such as those that may be relevant when developing innovative formulations.

Functional requirements

There may be more flexibility in certain functional requirements than has been acknowledged in the abridged alternatives assessment. For example, specifications for slump and cure time are designed around the existing polyurethane foam products. These specifications may be important in many applications, but other specifications could also be effective for many applications. For example, a different material could be used to serve the same functional use with a somewhat longer cure time, if the material is less prone to slump.

Options to reduce unreacted MDI

Even without considering alternative formulations, the responsible entities could have provided valuable information by considering ways to reduce the total amount of unreacted MDI in the product. This is an important component of the analysis, given that the regulation was written to focus on unreacted MDI specifically. There is room for improvement in processing and installation of MDI-containing spray foam polyurethane insulation. To the extent that the responding entities are unable to identify any safer alternatives, it would be helpful to see more

[1] See: https://www.epa.gov/sites/production/files/2015-09/documents/mdi.pdf

information in the assessment about ways they are working to improve their products and equipment to address the on-going hazard.

Conclusions

The responsible entities have addressed several areas in an incomplete way, which may mask important innovations and opportunities. For example, they have used present commercial availability as a proxy for feasibility more generally, missing the larger picture of feasible alternatives.

Due to the hazards of MDI, substantial research has been conducted on alternatives. The ultimate goal of the designation of this product as a priority product, and the resulting analysis, is to protect human health from the hazards of MDI. It would be helpful if the responding entities provided information on how they plan to protect workers from on-going health hazards and how they will employ green chemistry techniques to improve upon their existing product. Until an alternative can be identified, it would be valuable for responsible entities to reduce MDI in products to the greatest extent possible and to share best practices to mitigate impacts and minimize harm to workers and the public.

TURI frequently gathers and presents hazard and alternatives information for use by Massachusetts businesses. An alternatives assessment is an excellent opportunity to provide a thorough and clear comparison among alternatives based on hazard, among other outcomes. In the present submission, the compilation of ingredient information that is provided for certain formulations is helpful. However, it is disappointing that the review of hazard and related information is not sufficiently complete to be useful for TURI's on-going work and for others seeking comprehensive information on alternatives. It is also disappointing that the analysis is defined so narrowly that the full range of practical alternatives is not considered.

[1] See TURI, "Decision Making Under TURA: Resources for the TURA Administrative Council and Advisory Bodies," Methods and Policy Report No. 28, published 2010, updated 2015 and 2018.