

Toxics Use Reduction Institute Science Advisory Board Meeting Minutes

May 12, 2023

Virtual Zoom Meeting

1:00 PM

Members Present: Robin Dodson (Chair), Christine Rioux (Vice Chair), Alicia Timme-Laragy, Heather Lynch, Lisa Cashins, Helen Poynton, Christy Foran, Wendy Heiger-Bernays, Rich Gurney

Members not present: Denise Kmetzo

Program staff present: Liz Harriman (TURI), Heather Tenney (TURI), Karen Thomas (TURI), Hayley Hudson (TURI), Gabriel Salierno (TURI), Sandra Baird (MassDEP), Tiffany Skogstrom (OTA)

Others present: Carol Holahan (Foley Hoag ACC), Christina Bramante (Nano-C), Raza Ali (ACC), Katherine Robertson (MCTA), Jerome Lang (Nano-C), Laura Spark (Clean Water Action), Owen Jappen (ACC)

Welcome & Introductions

The chair noted that this meeting is being conducted remotely, due to an extension of the temporary provisions of the open meeting law signed March 29th 2023 by Governor Healey. This allows the extension of the remote meetings under the Open Meeting Law until March 31, 2025.

Today we are welcoming a new member, Alicia Timme-Laragy. Dr. Timme-Laragy is an Associate Professor of Environmental Health Sciences at the University of Massachusetts Amherst and fills the slot nominated by the Department of Public Health. Board members introduced themselves, program staff were announced, and attendees were asked to put their name and affiliation in the chat.

Approve March Meeting Minutes

A motion was made to approve the March meeting minutes, and there was a second. A roll call vote was conducted, and the minutes were approved by the nine members present with seven votes in favor and two abstentions.

Flame Retardant Law

A board member disclosed that she has filed an appearance of conflict with the governor's office as she is currently working on one of the covered flame retardants for the American Chemistry Council.

TURI presented the requirements of the [Massachusetts Flame Retardant Law](#) ("FR law"), pointing out the differences between the FR law and TURA. The FR law is a ban of, initially, 11 chemicals and their chemical analogues in certain covered products above threshold. The law requires MassDEP to consult with TURI and the SAB on the chemicals to be covered under the law. TURI has organized the 11 initial chemicals into seven subclasses (according to the National Academy of Sciences definitions), and researched analogues of the 11. MassDEP is asking for SAB input on three questions at this time.

Additional CAS Identifiers

Q1: Does the board agree that these additional CAS (Chemical Abstract Services) numbers of the original flame retardants in the law should be included in the regulations?

It was noted that additional CAS numbers are frequently assigned, e.g., when a research paper mentions a new chemical, CAS assigns a unique number to it.

Positional Isomers

Q2: Does the Board agree that these isomers of the original flame retardants in the law should be included in the regulations?

TURI reviewed positional isomers (chemicals with the same molecular formula) of each of the 11 chemicals by subclass.

- A question was posed: When CAS numbers identify a mixture of isomers, would the threshold limit in the law apply to the whole quantity, or just the specific CAS/isomer identified in the law? In particular, chlorinated paraffins were discussed, as they are always mixtures and short chains (C10-13) are the specific chain length range specified in the law. Similarly, commercially available PBDEs have always been a mixture of isomers.
- For stereoisomers, the stereochemistry is not always known. A board member stated they don't see the difference or distinguishing characteristics of these – they are all the same or nearly the same chemical and they should all be included.

Do isomers also satisfy the chemical analogue definition?

The definition was reviewed and the Board members agreed that isomers satisfy the definition.

Q3. Does each proposed chemical analogue meet the analogue definition?

TURI and MassDEP have identified have chosen 24 closely related analogues to be considered by the SAB at this time.

Subclass 2 – Polyhalogenated Diphenyl Ethers

Board members agreed: the PDBEs only differ in the number of bromines and the PDBEs identified are analogs.

Subclass 3 – Polyhalogenated Alicycles

Board members agreed: the polyhalogenated alicycles identified are analogs.

Subclass 1 – Polyhalogenated Organophosphates

Board members agreed: the polyhalogenated organophosphates identified are analogs. Structural similarity is nearly identical. A key reason to include analogues is to prevent regrettable substitutions and brominated tris and chlorinated tris are a classic example of regrettable substitution.

Subclass 4 – Polyhalogenated Phthalates, Benzoates, and Imides

Board members agreed: the polyhalogenated phthalates, benzoates, and Imides identified are analogs. See identical substructures.

Subclass 5 – Polyhalogenated Bisphenol Aliphatics

Board members agreed: the polyhalogenated bisphenol aliphatics identified are analogs. They have the same substructures.

Subclass 7 – Inorganics

Board members agreed: the antimony compounds identified are analogs. Antimony compounds have different oxidation states, but that could also be changed with temperature change or in the environment.

TURI summarized how some other states (e.g., New York, New Hampshire, Maine, California) are categorizing flame retardants as very large categories.

Visitor Comments

A visitor commented that any proposed consideration of additional flame retardants should take into account whether these materials are likely to be used in the identified products regulated under 310 CMR 78.00. Several of the specific substances and subclasses are unlikely to be used in the covered applications and this could help inform the scope of the SAB's review and also help focus any recommendations. Any proposed consideration of additional flame retardants and subclasses should be based on the current state of the science and recognition that not all flame retardants are the same even within specific subclasses, as noted in *ACC NAFRA Comments to the SAB (May 2023)*. Any substances that do not clearly show all the same properties for all endpoints should be excluded. In addition, it should be taken into account whether the flame retardant is additive or polymeric, as this impacts exposure.

Another visitor commented that the current question is just around analogues and isomers, and that section of the law says that a product shall not be sold if it contains any of the identified chemicals or their analogues. The section of the law that covers adding other flame retardants would consider the issues just raised by the previous commenter.

Board Discussion

After this input, the questions were again considered and discussed by the board:

1. Does the board agree that these **additional CAS numbers** of the original flame retardants in the law should be included in the regulations? The board agreed they should be included, noting that those CAS numbers that are mixtures (e.g., paraffins) also meet the definition of analogue.
2. Does the board agree that these **isomers** of the original flame retardants in the law should be included in the regulations? The board agreed the isomers presented are all similar enough to be included.
3. Do these **isomers** also fit the analogue definition? The board agreed they meet the analogue definition.
4. Do the 24 proposed close **analogues** meet the analogue definition? Each proposed analogue was briefly reviewed, and the board agreed they all fit the definition, while also noting that the definition is quite broad.

MassDEP is also asking the board's input on whether each proposed **analogue** is sufficiently similar to at least one chemical identified in the law such that the proposed analogues would be reasonably anticipated to have similar concerns regarding toxic hazards, persistence, or bioaccumulation. This will be considered at the fall SAB meeting, and board members were asked about what information would be helpful for that discussion.

It would be helpful to have more toxicity data, perhaps something that draws in computational toxicology receptor activity and/or some tables that have a comparison of properties (e.g., bioaccumulation factors). Additionally, the functional groups that are most important to define the hazard, if possible.

A board member noted that the law states these 11 chemicals and their analogues. Aren't analogues automatically included? A MassDEP representative said this is a question of how much do we need to show, and they are seeking the board's advice. They aren't looking for a deep toxicology dive, but are interested in what information is sufficient for DEP to know they are not being overly broad and have made a good decision. A board member asked what evidence is available to allow us to make that statement. It will vary by subclass- TURI will see what is available and pull together some information for the fall meeting.

Threshold Determination Background

TURI reviewed where we are with nanomaterials and how we have historically determined if something is a higher hazard substance. The petition asked nanomaterials to be listed with a lower threshold of 100 grams and the only way for that to happen is for them to be listed as a higher hazard substance (which would lower the threshold to 1,000 pounds and allow for further lowering of the threshold). Most members were not on the board when the last higher hazard substance (HHS) designations were made in 2016. The process consists of collecting a standard set of information, then using expert judgement to add substances to the SAB's guidance list of More Hazardous Chemicals (MHC) and Less Hazardous Chemicals. From the MHC list, recommendations are made to the Administrative Council for TURA HHS designation. Generally, higher hazard substance recommendations have been either IARC 1 or 2A or acutely toxic. However, this process can evolve. Typically, we only consider hazard, however EPA has lowered thresholds under TRI due to potential for health or environmental impacts at low exposures or low use quantities in industry. To inform this discussion, some background information on exposures of carbon nanotubes and fibers being observed in industry was presented, as CNT and CNF are typically used at much lower volumes.

Nanomaterial Exposure Summary Presentation

A board member presented information summarizing SWCNT, MWCNT, and CNF exposure and the [slides are available on the TURI website.](#)

- The presentation discussed different studies that did air sampling for nanomaterials and the results, as well as how asbestos is measured in the field. Studies documenting workplace exposure to CNTs and CNFs in different manufacturing/use situations were reviewed, including both inhalation and dermal exposure.

A board member asked for clarification of EPA's approach to lowering thresholds. EPA has justified lowered thresholds when very low uses may still have the potential for impacts.

A board member expressed concern that the workers weighing out the nanomaterials were wearing PPE and still having exposures higher than the REL; similarly, there was measured exposure even when using a hood.

TURI clarified that we are not doing a risk determination. A visitor asked if the studies measured background carbon levels; the board member presenting said yes, some studies did measure background carbon levels but not necessarily all did or documented it in the study.

Next Meeting

The objective would be to have a June meeting to wrap up nanomaterials. Heather will send out a When2Meet. There was a motion to adjourn and there was a second.

Chat Comments (relevant comments inserted verbatim from Zoom chat, note that first 45 min. of chat was lost when meeting had to be closed and restarted)

1:52 PM From Heather Lynch to Everyone:

Just FYI on those paraffins, on EPA CompTox dashboard that particular CAS says "This CAS is often used to denote chlorinated paraffin waxes of unspecified carbon chain length and degree of chlorination. Long-chain chlorinated paraffins (LCCPs); $C_nH_{(2n+2-y)Cl_y}$, where $n=18-32$ and $y=4-30$ UVCB - Unknown, of Variable Composition, or of Biological Origin." There are CASRNs for the specific C10-13 range and the other long-chains also. So there seems to be some chain lengths that could be identified in that CASRN that don't fall under the law. So if we don't think that's a problem, that's fine, I just wanted to point it out.

Sandra Baird (MassDEP) to Everyone 2:08 PM

Are any of the FR used as a pure single isomeric structure? Or are they all used/applied as mixtures of isomers?

Katherine Robertson to Everyone 2:34 PM

since you are not taking votes, this probably does not matter but do you still have quorum?

Heather Tenney to Everyone 2:35 PM

There is a quorum

Christina Bramante to Everyone 2:56 PM

Hello, Christina Bramante, representing Nano-C has joined the call

Zoom user to Everyone 2:59 PM

Zoom User is me-Carol Holahan

Christina Bramante to Everyone 3:39 PM

Is the SAB considering exposure in their determination of "High Hazard?" If yes, this leads to a risk determination? Lisa, please may I ask if background carbon levels were assessed in these studies? Understood. Thank you Heather Ok, thank you Lisa

Christina Bramante 3:44 PM

Thank you

Handouts

Presentation: *SWCNT, MWCNT AND CNF EXPOSURE SUMMARY* by Lisa Cashins

TURI 2023: An Act to Protect Children, Families and Firefighters from Harmful Flame Retardants

Proposed Additional CAS numbers/Isomers/Analogues of the 11 Flame Retardants Identified in the Law

ACC NAFRA Comments to the SAB