Human Exposure to Flame Retardant Chemicals and Health Concerns

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Oral Testimony

Good morning. I wish to thank Senator Lautenberg, Senator Crapo and the other members of this Committee for inviting me to testify here today. I am Heather Stapleton, an associate professor of environmental chemistry at Duke University. For the past 10 years I've been conducting research on flame retardant chemicals and today I'd like to talk to you about my research and what we know about health risks to humans.

Current scientific evidence demonstrates that the US population is exposed to flame retardant chemicals that are used in consumer products, at levels that are approximately 10 times higher than levels in European and Asian countries, likely due to differences in our flammability standards. According to research conducted by the Centers for Disease Control and Prevention, 99% of the US population has flame retardant chemicals in their bodies. Studies have also shown that children have much higher body burdens of these chemicals compared to adults. This is a concern given that health studies found that higher body burdens of these chemicals were associated with reductions in IQ and motor skills in children, lower birth weights in infants, changes in hormone levels, and reductions in a women's potential to become pregnant. In my opinion, this evidence warrants changes to the way these chemicals are currently applied

to consumer products, and highlights a need to reduce our exposures in vulnerable populations such as infants and children.

I would now like to summarize several key findings from my research:

- **It is impossible** for an average person to avoid exposure to these chemicals. The primary route of human exposure to these chemicals is from inadvertent ingestion of dust particles in the home, which is more pronounced for infants and young children that are more vulnerable to chemical exposures. My research group has analyzed hundreds of samples of indoor dust and to date, I have not found **one** sample that does NOT contain the flame retardants known as PBDEs.

- **An average consumer** does not have the choice or an option to buy flame retardant free products. There are no labels indicating whether or not a flame retardant chemical has been applied; the only way to determine if a product is treated with these chemicals is to take a sample of the material and chemically analyze it in a laboratory using very expensive analytical equipment. This allows us to determine the chemical structures of these chemicals which are often proprietary. My research team has analyzed over 100 samples of residential furniture purchased in the US and found that more than 85% is treated with several different types of chemical flame retardants, as our most baby products that are considered furniture items. This includes nursing pillows, sleep positioners, and car seats. Infants spend almost 24 hours a day in

intimate contact with these items and no risk assessments have been conducted to determine the level of exposure an infant receives during use of these products.

- **The two most common flame retardants** detected in furniture and baby products on the market today are chemicals known as “Chlorinated Tris” and Firemaster 550, replacements for the now phased out PBDEs. Cl Tris is a suspected carcinogen and the Consumer Product Safety Commission estimated that a child’s exposure to Cl Tris from residential furniture would be 5 times higher than the acceptable daily limit. This assessment did **not** include infant’s exposure to Cl Tris from baby products, which would likely increase this exposure. In addition, a very recent study conducted by my colleagues and I found that exposure to FM 550 in rodents resulted in obesity, changes in hormone levels, advanced puberty, and altered behavior at a level that was more than 10 fold LOWER than the level the chemical company cited as safe. Our research also shows that these same two flame retardants are now found in more than 95% of US homes and levels in indoor environments are just as high as the levels of PBDEs, implying exposure levels are the same.

- **These points highlight** what I call the “chemical conveyer belt”. When one chemical is phased out, another similar chemical is often used as a replacement and we know less about its potential health effects and exposure than the chemical it replaced. History has shown that it often takes millions of taxpayers dollars and several decades

collecting data on these new chemicals before we realize there is a health hazard. We should, in my opinion, consider how this process could be reformed.

In closing I would like to urge this Committee to strongly consider legislation that would reduce our children's exposure to these suspected carcinogens and potential toxins, which **can be done** without compromising fire safety, as was demonstrated at the hearing last week. I have dedicated much of my scientific career to testing consumer products for these chemicals to provide information on potential sources in the home. In my opinion, these products should be labeled to indicate chemical treatments, to allow consumers a choice, particularly when it involves the use of suspected carcinogens in baby products. Lastly I would just like to note that my research has been funded by the National Institute of Environmental Health Sciences and the National Science Foundation and I thank you for considering my testimony.