



UvA-DARE (Digital Academic Repository)

Environmental fate & effects of new generation flame retardants

Waijers, S.L.

Publication date
2014

[Link to publication](#)

Citation for published version (APA):

Waijers, S. L. (2014). *Environmental fate & effects of new generation flame retardants*.

General rights

It is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), other than for strictly personal, individual use, unless the work is under an open content license (like Creative Commons).

Disclaimer/Complaints regulations

If you believe that digital publication of certain material infringes any of your rights or (privacy) interests, please let the Library know, stating your reasons. In case of a legitimate complaint, the Library will make the material inaccessible and/or remove it from the website. Please Ask the Library: <https://uba.uva.nl/en/contact>, or a letter to: Library of the University of Amsterdam, Secretariat, Singel 425, 1012 WP Amsterdam, The Netherlands. You will be contacted as soon as possible.

Epilogue

The application of certain hazardous FRs inevitably brings up the question if we really need FRs in all the products in which they are applied. It is debatable whether the risk of using compounds that are not proven to be completely harmless to the environment and human health outweighs the benefits. Regulations requiring industry to incorporate FRs, without carefully weighing the positive and negative impacts, may in some cases overshoot the target and result in adverse environmental and health effects (Shaw et al., 2010). In this way, the use of FRs can result in a false sense of security. For example, for furniture foam it has been argued that the addition of potentially hazardous FRs does not always effectively increase the fire safety (Babrauskas et al., 2011). As the use of FRs in building insulation does not necessarily provide an additional safety benefit (Babrauskas et al., 2012), recently, a law was adopted in California no longer forcing manufacturers to use FRs (State of California, 2013). Under this changed legislation, manufacturers are free to choose whether they apply FRs or alternative methods for maintaining fire safety. Likewise, other safety requirements were adapted to give manufacturers of furniture and foam used in baby products (mattresses, toys, etc.) the freedom to achieve fire safety without the use of chemicals (State of California and Department of Consumer Affairs, 2013). Recently, the question has also been brought forward whether FRs are needed in every electrical or electronic application (Scientific American, 2014). In line with this idea, recent studies assessed the flame retardant properties of natural materials that are known to be safe, such as proteins, sometimes leading to remarkable results showing the potential fire retardancy of unexpected materials (Carosio et al., 2014; Alongi et al., 2013). In contrast to the U.S.A., where substantial effort has been put into reversing the mandatory application of FRs, in The Netherlands pressure is now exerted in Parliament to make the use of FRs compulsory in home textiles, such as those used for couches (Kamerstuk 29 956 & 29 517, 2013). Oppositely, the minister of Health, Welfare and Sport (VWS) argued that the number of fire fatalities in the Netherlands is not commensurate with the exposure to FRs that would come from mandatory application (Kamerstuk 29 517, 2012). The application of FRs can be a very effective and useful way to prevent the spread of fire, but by making its application mandatory, there is no latitude for alternative solutions, innovations and the choice for customized application of HFFRs. It is argued that there is no valid statistical evidence showing that FRs of the types and concentrations used in consumer products have resulted in

fire death or injury reduction (Scientific American, 2014). There is also no detectable decline of fire-caused fatalities in The Netherlands based on the statistics from 1946 to 2012 (Nationaal Brandweer Documentatie Centrum (NBDC)). In some cases, fire safety can be achieved without the use of FRs by changing designs or choosing materials that are less combustible (Shaw et al., 2010; Betts, 2007). Alternatively, measures such as fire-safe cigarettes, child-resistant lighters, the use of smoke detectors and sprinklers increase fire safety around furniture without using FRs (Shaw et al., 2010). The lack of direct proof of decreasing numbers of fire casualties due to the use of FRs, does not imply that FRs should not be used at all. It has been proven that the use of some FRs can provide significantly longer escape time, lower the heat release and lower the release of toxic gases during fires (American Chemistry Council; Zhang et al., 2011). From an ethical point of view, the use of FRs in clothing, especially for children, seems inevitable, although informing the public on what to wear might help preventing dramatic fire injuries (Volkskrant, 2001). A complete ban on FRs is therefore not desirable, but with the growing evidence of unwanted adverse side effects of these compounds, we have to carefully balance the direct risk reduction of fire spread against the potential global impact of contaminants on the long term. The application of HFFRs should be, as with all anthropogenic chemicals, controlled and moderate. The decision is up to all of us, keeping in mind that ultimately, everyone has to live with some margin of risk (Maron, 2014).