

Paper 5.1 - The effects of flame retardants on human health: developing a work programme

Introduction

Under the UK REACH Work Programme 2022-23, the Environment Agency commissioned a scoping report to review and update the evidence on the potential risks of chemical flame retardants (FRs) in Great Britain, to feed into wider chemicals policy.

Based on UK REACH registrations (73), and on Downstream User Import Notifications (DUINs) for substances registered in EU REACH at or above 100 tonnes/year (51), the report examined 124 FRs present on the GB market. These substances were prioritised based on three methods: tonnage, hazard, and risk assessment (environmental, and human health via the environment) using generic exposure modelling. The report identifies four broad use categories (polymers, sealants, textiles and coatings). It identifies around 60 substances as priorities for further consideration based on potential hazards and risks to the environment and human health via the environment, spanning all chemistries. As one HSAC member concluded: “the challenge is to therefore provide defensible groupings of FRs despite gaps and uncertainties.” We are keen to further narrow down priority substances or groups for further action, by triangulating the EA report’s conclusions with substances that present the greatest risk to human health from direct exposure through contact, inhalation etc. We understand that there is no reliable economic valuation of the benefits versus risks of different FRs to support our prioritisation at present.

Human health impacts of FRs

HSAC supported the development of the EA report, and raised concerns over the lack of coverage of human health impacts of FRs via direct exposure e.g. occupational or domestic, through inhalation or dust, arising from close proximity/high loadings in homes, offices etc.

We are now looking at what is possible to achieve within this space and want to utilise the committee’s expertise in this area.

Human health impacts can be looked at from many different angles:

- 1) Setting – occupational (e.g. construction, firefighting), domestic/public health
- 2) Uses – furniture, textiles, vehicles, firefighting foams, constructions materials
- 3) Chemical groupings – halogenated FRs, organophosphate FRs

- 4) Exposure routes – inhalation, ingestion, dermal contact
- 5) Human health impact – reproductive toxicant, neurotoxicant, PBT/vPvB or EDC
- 6) Potential overlap of HH with those assessed as having high environmental impact in EA report
- 7) Possible restriction options
- 8) Lifecycle – manufacture, use, recycling – exposure potential after service life

Our policy aim is to identify priorities for further regulation and we want to understand the most effective way to prioritise different chemicals/chemical groups.

There is a significant volume of toxicological research on a wide range of individual FRs, but we have struggled to find systematic reviews or meta-analyses looking at groups of flame retardants across multiple chemistries and human exposure routes. The Committee on Toxicity has examined the human health impacts of some flame retardants previously, releasing a [statement](#) on the effects of organophosphates in adults in 2015.

One HSAC member suggested: “A relatively simple pathways analysis/screening of pathways could be added/envisaged, which relates to certain product categories (e.g. uses in furniture, vehicles, textiles) and then the likelihood of releases into dusts/vapour forms/direct skin contact etc, the tendency to bioaccumulate etc. This can be a ‘first step’ in moving from the current hazard based assessments towards a qualitative/semi-quantitative screening approach to help risk assessment. It will also flag which types of FRs are most likely to reach the general population via widespread uses indoors and via what routes.” We would be interested to hear more about this proposed approach, and how it could be taken forward in practice.

In order to support policy decisions on where to prioritise regulatory efforts from a Government perspective, we are looking for an efficient and pragmatic methodology to generate a broad brush assessment of human health priority groups or exposure routes, in order to triangulate human health impacts with the environmental priorities identified by the EA report.

Questions for the Committee:

1. To what extent should we consider human health impacts of flame retardants as a priority concern?

- How can we determine and characterize the level of risk?
- What methodology could we use for this to initiate a timely response to recommendations from the EA scoping report?

- How can we go about determining whether action is needed? What actions might be feasible/impactful to address this risk?

2. What data/systematic reviews/meta-analyses already exist in this field?

- What is unknown? What are the key data/evidence gaps? Who are the key researchers in this area?
- How can we prioritise different factors in this issue?
- Are there certain groups of FRs we should focus on to manage scope of the exercise?
- How should we classify these groups? E.g. by structure, mode of action, hazard?

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Outputs

Can the group support us in defining practical next steps to determine how to prioritise regulatory action on FRs from a human health perspective?