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Annex No. 10 to the MU Directive on Habilitation Procedures and Professor Appointment Procedures

HABILITATION THESIS REVIEWER'S REPORT

Masaryk University	
Applicant	Lisa Emily Melymuk, Ph.D.
Habilitation thesis	Tracking the chemical signal of modernity: linking policy, behaviour and environment to understand human exposure to chemical pollution
Reviewer	Prof Rainer Lohmann, Ph.D.
Reviewer's home unit, institution	Graduate School of Oceanography, University of Rhode Island, USA

[Review text]

Dr. Melymuk's habilitation thesis focuses on understanding the human exposure to various man-made organic chemicals, mostly semi-volatile ones. In particular, she has presented a comprehensive framework for understanding chemical exposure, combining chemical policy, lifestyle impacts and environmental factors.

The text of the habilitation thesis is based on a selection of 20 peer-reviewed publications. Dr. Melymuk was the first and/or corresponding author on 7 papers, which were typically published in the leading journals in the field. The publications are listed in the thesis and are categorized according to the author's contribution to experimental work, mentoring, manuscript preparation, and research guidance. The full texts of each publication are given in the appendices.

The habilitation thesis is clearly written, and structured in three main sections focused on chemical exposure, with an additional sections reviewing the available tools for characterizing chemical exposure. The section on chemical exposure as impacted by chemical policy clearly shows differences between competing regulatory approaches to chemical regulation (e.g., US, Canada and the EU) as exemplified for PBDEs, or PCBs. The section on lifestyle impacts to chemical exposure highlights the importance of consumer products as carriers of chemicals into people’s lives and homes. Environmental Factors explain the additional constraints on chemical exposures, such as the age of homes that determine whether legacy POPs were used and create higher indoor air and dust concentrations.

The fourth part of the habilitation thesis covers the available sampling and analytical approaches and tools to determine chemical exposures, in particular the advent of passive sampling of POPs in- and outdoors. The final section summarizes results and offers ideas and implications of the performed work. Overall, this is a very strong habilitation thesis.

Reviewer's questions for the habilitation thesis defence (number of questions up to the reviewer)

1 – To measure volatile PFAS in passive samples, have you considered the use SIP-PUFs? Alternatively, for ionic PFAS, there should be no deviation from linear uptake – have you looked into the presence of ionic PFAS on PUF disks?

2 – An alternative approach for determining personal exposure is to rely on personal passive samplers, such as the silicone wristbands, or other “worn” samplers. What are the benefits and shortcomings of that approach, relative to relying on passive samplers placed in people’s homes?

3 – Within a home, there are many options where to place the passive samplers. Do you expect major differences between the bedroom and other, more publicly accessible spaces? Where would the ideal deployment location be (and where have you typically deployed)?

4 – You have nicely identified major pollutant exposure differences between, e.g., the US, Canada and the Czech Republic. You could use that to probably link an unknown sample to being from the US if PBDEs were high. Is there any marker or compound that would suggest the sample was from the EU (either by presence, absence or a unique ratio)?

Conclusion

The habilitation thesis entitled “Tracking the chemical signal of modernity: linking policy, behaviour and environment to understand human exposure to chemical pollution” by Lisa Emily Melymuk, Ph.D. **fulfils** requirements expected of a habilitation thesis in the field of Environmental Health Sciences.

Date: 05 Feb. 25 Signature: