

COMMENTARY TO HABILITATION THESIS¹

The study of chemical exposures from consumer products and in indoor environments has grown rapidly in the past 20 years, with large steps forward in our understanding of how chemicals are emitted from products, combined exposures from multiple sources, and the effectiveness of actions to reduce exposures. The text of my habilitation thesis summarizes many of these developments, supported by work which I have completed over the past ten years.

The studies combine results from field campaigns with measurements and modelling of a wide range of chemicals in environmental samples, as well as incorporation of policy and regulatory information to provide insight into chemical use factors driving trends in exposure. This multi-disciplinary research is necessary in modern environmental chemistry, as addressing challenges in the discipline requires contributions from environmental monitoring, environmental policy and exposure modelling.

I have selected 20 articles to contribute to my habilitation thesis. My contributions are summarized below concerning experimental work, supervision, manuscript preparation and research direction. Experimental work is assumed to include sample collection and laboratory analysis and/or environmental model development and application. Supervision refers to supervision of a project, including supervision of students or postdocs. Manuscript refers to data analysis and interpretation as well as writing, visualizations, and final dissemination, while research direction refers to project development, design of experimental work and direction of interpretations and analyses to be performed.

[1]² 1. van der Schyff, Veronica, Jiří Kalina, Annalisa Abballe, Anna Laura Iamiceli, Eva Govarts, and Lisa Melymuk. 2023. "Has Regulatory Action Reduced Human Exposure to Flame Retardants?" *Environmental Science & Technology* 57 (48): 19106-24. <https://doi.org/10.1021/acs.est.3c02896>

Experimental work (%)	Supervision (%)	Manuscript (%)	Research direction (%)
25	90	40	80

[2] Melymuk, Lisa, Jonathan Blumenthal, Ondřej Sáňka, Adriana Shu-Yin, Veena Singla, Kateřina Sebková, Kristi Pullen Fedinick, and Miriam L Diamond. 2022. "Persistent Problem: Global Challenges to Managing PCBs." *Environmental Science & Technology* 2022: 9040. <https://doi.org/10.1021/acs.est.2c01204>

Experimental work (%)	Supervision (%)	Manuscript (%)	Research direction (%)
60	30	40	15

[3] Venier, Marta, Ondřej Audy, Šimon Vojta, Jitka Bečanová, Kevin Romanak, Lisa Melymuk, Martina Krátká, Petr Kukucka, Joseph Okeme, Amandeep Saini, Miriam L. Diamond, Jana Klanova. 2016. "Brominated Flame Retardants in Indoor Environment -

¹ The commentary must correspond to standard expectations in the field and must include a brief characteristic of the investigated matter, objectives of the work, employed methodologies, obtained results and, in case of co-authored works, a passage characterising the applicant's contribution in terms of both quality and content.

² Bibliographic record of a published scientific result, which is part of the habilitation thesis.

Comparative Study of Indoor Contamination from Three Countries." *Environment International* 94: 150-60. <https://doi.org/10.1016/j.envint.2016.04.029>

Experimental work (%)	Supervision (%)	Manuscript (%)	Research direction (%)
20	15	30	15

[4] van der Schyff, Veronica, Jiří Kalina, Eva Govarts, Liese Gilles, Greet Schoeters, Argelia Castaño, Marta Esteban-López, Jiří Kohoutek, Petr Kukučka, Adrian Covaci, Gudrun Koppen, Lenka Andrášková, Pavel Piler, Jana Klánová, Tina Kold Jensen, Loic Rambaud, Margaux Riou, Marja Lamoree, Marike Kolossa-Gehring, Nina Vogel, Till Weber, Thomas Göen, Catherine Gabriel, Dimosthenis A. Sarigiannis, Amrit Kaur Sakhi, Line Småstuen Haug, Lubica Palkovicova Murinova, Lucia Fabelova, Janja Snoj Tratnik, Darja Mazej, Lisa Melymuk. 2023. "Exposure to Flame Retardants in European Children - Results from the HBM4EU Aligned Studies." *International Journal of Hygiene and Environmental Health* 247: 114070. <https://doi.org/10.1016/j.ijheh.2022.114070>

Experimental work (%)	Supervision (%)	Manuscript (%)	Research direction (%)
0	40	50	40

[5] Diamond, Miriam L., Joseph O. Okeme, and Lisa Melymuk. 2021. "Hands as Agents of Chemical Transport in the Indoor Environment." *Environmental Science & Technology Letters* 8 (4): 326-32. <https://doi.org/10.1021/acs.estlett.0c01006>

Experimental work (%)	Supervision (%)	Manuscript (%)	Research direction (%)
0	20	50	30

[6] Stuchlíková Fišerová, Petra, Lisa Melymuk, Klára Komprdová, Elena Domínguez-Romero, Martin Scheringer, Jiří Kohoutek, Petra Příbylová, Lenka Andrášková, Pavel Piler, Holger M. Koch, Martin Zvonař, Marta Esteban-López, Argelia Castaño, Jana Klánová. 2022. "Personal Care Product Use and Lifestyle Affect Phthalate and DINCH Metabolite Levels in Teenagers and Young Adults." *Environmental Research* 213: 113675. <https://doi.org/10.1016/j.envres.2022.113675>

Experimental work (%)	Supervision (%)	Manuscript (%)	Research direction (%)
-	90	40	80

[7] Schyff, Veronica van der, Lenka Suchánková, Katerina Kademoglou, Lisa Melymuk, and Jana Klánová. 2022. "Parabens and Antimicrobial Compounds in Conventional and 'Green' Personal Care Products." *Chemosphere* 297: 1-8. <https://doi.org/10.1016/j.Chemosphere.2022.134019>

Experimental work (%)	Supervision (%)	Manuscript (%)	Research direction (%)
10	90	35	75

[8] Demirtepe, Hale, Lisa Melymuk, Miriam L. Diamond, Lola Bajard, Šimon Vojta, Roman Prokeš, Ondřej Sáňka, Jana Klánová, Ľubica Palkovičová Murinová, Denisa

Richterová, Vladimíra Rašplová, Tomáš Trnovec. 2019. "Linking Past Uses of Legacy SVOCs with Today's Indoor Levels and Human Exposure." *Environment International* 127: 653-63. <https://doi.org/10.1016/j.envint.2019.04.001>

Experimental work (%)	Supervision (%)	Manuscript (%)	Research direction (%)
10	60	40	40

[9] Holt, Eva, Ondřej Audy, Petra Booi, Lisa Melymuk, Roman Prokes, and Jana Klánová. 2017. "Organochlorine Pesticides in the Indoor Air of a Theatre and Museum in the Czech Republic: Inhalation Exposure and Cancer Risk." *Science of The Total Environment* 609: 598-606. <https://doi.org/10.1016/j.scitotenv.2017.07.203>

Experimental work (%)	Supervision (%)	Manuscript (%)	Research direction (%)
0	60	40	30

[10] Bečanová, Jitka, Lisa Melymuk, Šimon Vojta, Klára Komprdová, and Jana Klánová. 2016. "Screening for Perfluoroalkyl Acids in Consumer Products, Building Materials and Wastes." *Chemosphere* 164: 322-29. <https://doi.org/10.1016/j.Chemosphere.2016.08.112>

Experimental work (%)	Supervision (%)	Manuscript (%)	Research direction (%)
0	55	40	40

[11] Vojta, Šimon, Jitka Bečanová, Lisa Melymuk, Klára Komprdová, Jiří Kohoutek, Petr Kukučka, and Jana Klánová. 2017. "Screening for Halogenated Flame Retardants in European Consumer Products, Building Materials and Wastes." *Chemosphere* 168: 457-66. <https://doi.org/10.1016/j.Chemosphere.2016.11.032>

Experimental work (%)	Supervision (%)	Manuscript (%)	Research direction (%)
0	65	40	40

[12] Vojta, Šimon, Lisa Melymuk, and Jana Klánová. 2017. "Changes in Flame Retardant and Legacy Contaminant Concentrations in Indoor Air during Building Construction, Furnishing, and Use." *Environmental Science & Technology* 51 (20): 11891-99. <https://doi.org/10.1021/acs.est.7b03245>

Experimental work (%)	Supervision (%)	Manuscript (%)	Research direction (%)
0	40	50	30

[13] Vykoukalová, Martina, Marta Venier, Šimon Vojta, Lisa Melymuk, Jitka Bečanová, Kevin Romanak, Roman Prokeš, Joseph O. Okeme, Amandeep Saini, Miriam L. Diamond, Jana Klanova. 2017. "Organophosphate Esters Flame Retardants in the Indoor Environment." *Environment International* 106: 97-104. <https://doi.org/10.1016/j.envint.2017.05.020>

Experimental work (%)	Supervision (%)	Manuscript (%)	Research direction (%)

20	25	30	15
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[14] Melymuk, Lisa, Pernilla Bohlin-Nizzetto, Petr Kukučka, Šimon Vojta, Jiří Kalina, Pavel Čupr, Jana Klánová, Pavel Čupr, and Jana Klánová. 2016. "Seasonality and Indoor/Outdoor Relationships of Flame Retardants and PCBs in Residential Air." *Environmental Pollution* 218: 392-401. <https://doi.org/10.1016/j.envpol.2016.07.018>

Experimental work (%)	Supervision (%)	Manuscript (%)	Research direction (%)
0	40	80	30

[15] Demirtepe, Hale, Lisa Melymuk, Garry Codling, Ľubica Palkovičová Murínová, Denisa Richterová, Vladimíra Rašplová, Tomáš Trnovec, and Jana Klánová. 2021. "Targeted and Suspect Screening of Plasticizers in House Dust to Assess Cumulative Human Exposure Risk." *Science of The Total Environment* 781: 146667. <https://doi.org/10.1016/j.scitotenv.2021.146667>

Experimental work (%)	Supervision (%)	Manuscript (%)	Research direction (%)
0	70	40	50

[16] White, Kevin B., Ondřej Sáňka, Lisa Melymuk, Petra Příbylová, and Jana Klánová. 2021. "Application of Land Use Regression Modelling to Describe Atmospheric Levels of Semivolatile Organic Compounds on a National Scale." *Science of The Total Environment* 793. <https://doi.org/10.1016/j.scitotenv.2021.148520>

Experimental work (%)	Supervision (%)	Manuscript (%)	Research direction (%)
20	90	30	90

[17] Melymuk, Lisa, Pernilla Bohlin-Nizzetto, Ondřej Sáňka, Karla Pozo, and Jana Klánová. 2014. "Current Challenges in Air Sampling of Semivolatile Organic Contaminants: Sampling Artifacts and Their Influence on Data Comparability." *Environmental Science & Technology* 48 (24): 14077-91. <https://doi.org/10.1021/es502164r>

Experimental work (%)	Supervision (%)	Manuscript (%)	Research direction (%)
- (review)	45	50	45

[18] Karásková, Pavlína, Garry P. Codling, Lisa Melymuk, and Jana Klánová. 2018. "A Critical Assessment of Passive Air Samplers for Per- and Polyfluoroalkyl Substances." *Atmospheric Environment* 185: 186-95. <https://doi.org/10.1016/j.atmosenv.2018.05.030>

Experimental work (%)	Supervision (%)	Manuscript (%)	Research direction (%)
0	80	40	40

[19] Melymuk, Lisa, Pernilla Bohlin Nizzetto, Tom Harner, Kevin B. White, Xianyu Wang, Maria Yumiko Tominaga, Jun He, Jun Li, Jianmin Ma, Wan-Li Ma, Beatriz H. Aristizábal, Annekatrin Dreyer, Begoña Jiménez, Juan Muñoz-Arnanz, Mustafa

Odabasi, Yetkin Dumanoglu, Baris Yaman, Carola Graf, Andrew Sweetman, Jana Klánová. 2021. "Global Intercomparison of Polyurethane Foam Passive Air Samplers Evaluating Sources of Variability in SVOC Measurements." *Environmental Science and Policy* 125: 1-9. <https://doi.org/10.1016/j.envsci.2021.08.003>

Experimental work (%)	Supervision (%)	Manuscript (%)	Research direction (%)
30	60	80	40

[20] Jílková, Simona, Lisa Melymuk, Šimon Vojta, Martina Vykoukalová, Pernilla Bohlin-Nizzetto, and Jana Klánová. 2018. "Small-Scale Spatial Variability of Flame Retardants in Indoor Dust and Implications for Dust Sampling." *Chemosphere* 206: 132-41. <https://doi.org/10.1016/J.CHEMOSPHERE.2018.04.146>

Experimental work (%)	Supervision (%)	Manuscript (%)	Research direction (%)
25	80	30	60