

Tuesday 26<sup>th</sup> September 2022, 4.15 pm – 5.15 pm

### Microplastics: industrial relevance and studies into environmental aging, composting, fragmentation

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**Science and Dept. Experimental**  
**Toxicology & Ecology**



**ABSTRACT.** Bans, reporting and labelling requirements for intentionally added primary microplastics serve to avoid their release into the environment during or after product application. The first part of the talk sets the scene on advanced material development and the impact of the imminent restrictions of microplastics, and impact of longer-term changes to regulation of polymers in general. Biodegradable polymers are derogated from the restriction proposed by the European Chemicals Agency. Biodegradation is based on microbial oxidation and hydrolysis processes that result in the complete transformation of polymer carbon into biomass and CO<sub>2</sub>. And yet, the ability to biodegrade in specific compartments is no excuse for littering. For intentional application in the environment, e.g., mulch films in agriculture, biodegradable polymers could contribute to the solution to the plastic pollution crisis – if they do not contribute to the issue: one may hypothesize that fragments of the original polymer part could form during the degradation processes, and/or that only certain components degrade. The second part of the talk is devoted to studies of the aging and fragmentation during composting of such an innovative polymers. We adapted known sensitive tools by extracting and counting polymer particles during their biodegradation in compost and soil. Results will be shared on polyester-PLA copolymer blends, benchmarked against LDPE as conventional non-degradable alternative. This is relevant for certified compostable food packaging, and methods can be applied as well to compostable bags and soil-degradable mulch films.

**BIO.** Wendel Wohlleben is Senior Principal Scientist at BASF, Dept. of Material Physics with a second affiliation to the Dept. of Experimental Toxicology and Ecology. He studied physics (minor chemistry) at the University Heidelberg and at the Ecole Normale Supérieure in Paris. He obtained his PhD from the University of Munich with a biophysical thesis on energy harvesting in photosynthesis, performed at the Max-Planck-Institute for Quantum Optics. The post-doc at Physical Chemistry, University Marburg was devoted to chemically resolved microscopy. Wendel is a researcher at BASF since 2005, interrupted by a sabbatical leave to the Weizmann Institute, Rehovot, and was visiting scientist at Harvard TH Chan School of Public Health, Boston (2012 to 2019).

At BASF, Wendel leads the research cluster on the impact assessment of nanomaterials, and another cluster on microplastics. His own labs develop and apply methods to characterize the interaction between such colloids and their environment, e.g., to understand the fate of microplastics. New aspects consider lifecycle releases from advanced materials that combine several components to achieve an intended functionality.

The presentation will be followed by a talk by Alexandra Foetisch, doctoral candidate from the Soil Science Group, on the topic:

*“Development of an easily implementable method for extraction and detection of tire wear particles in road sided soils.”*



You are welcome to attend in person in  
Hallerstrasse 12, seminar room 002.

