

Transport and transformation of emerging organic pollutants: From the technosphere to the environment

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In modern industrialized societies there are a large, and increasing, number of man-made chemical substances. Today >100 000 are produced in such amounts that they qualified for the REACH pre-registration list.

The wide variety of chemical substances occurring in consumer goods and chemical products will be emitted and lead to human and environmental exposure to mixtures of chemical substances, which has the potential to exert a combined toxicological effect. To make things worse the parent compounds may also transform in the technosphere or in the environment.

To handle such a complex emission scenario one may apply a top down (starting at the source) or bottom up approach (starting at the receptor end). This presentation will cover both.

As an example of the top-down approach, we have developed a molecular emission model with which it is possible to estimate the annual economy-wide emissions of organic chemicals from consumer goods and building materials.

We have also used direct measurements of emissions from sewage treatment plants and city dump cites to nearby recipients. Non-target screening analyses revealed a large number of emerging contaminants and transformation products of concern.

Finally, we have indications of secondary pollution. Very toxic brominated dioxins that are formed naturally in the environment and seems to increase in concentration as a result of climate change and increased nutrient load.