

Removal of pollutants from material cycles using thermal processes

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Project partners:

- GKS - Gemeinschaftskraftwerk Schweinfurt GmbH
- TEER - Thermoprocesses and Emission Control in Waste Management and Recycling Teaching and Research Unit, RWTH Aachen University
- Institute for Technical Chemistry (ITC), Karlsruhe Institute of Technology (KIT)

Every circular economy needs one or more sinks for pollutants. With regard to the removal of pollutants during thermal waste treatment, particular interest is focused on persistent organic pollutants (POPs) such as polybrominated dibenzodioxins and dibenzofurans (PBDD/F) as well as per- and polyfluorinated alkyl substances (PFAS). The latter are characterized by their high stability and persistence, which makes them considerably more difficult to degrade. PFAS are used in countless products due to their water and grease repellent properties. At the end of their service life, many of these products, some of which are harmful to health, end up in thermal waste treatment (TWT).

Within the scope of this project, the thermal degradation of PFAS is one of two focal points to be investigated by measurements at an industrial thermal waste treatment plant. For this purpose, test campaigns will be carried out at the waste incineration plant of Gemeinschaftskraftwerk Schweinfurt GmbH (GKS), where PBDD/F measurements will also be performed.

As no DIN/ISO-CEN standardized measurement method for PFAS measurement exists today, several different sampling methods are used to capture a wide variety of PFAS (e.g. OTM-45 of U.S. EPA). The comparison of these methods provides the basis for the normalization/standardization of future PFAS measurements, which is the second focus of the project.

In addition, a detailed literature review of existing PFAS and PBDD/F measurements at waste incineration plants worldwide will be carried out.

For the PFAS measurements, different feeding conditions regarding the waste composition are being tested. Gas measurements are carried out in the raw and clean gas of the plant. In addition to the gas sampling, a comprehensive sampling of solid and liquid streams from the plant is carried out to close the material balances.

Link to project partner:

<https://www.teer.rwth-aachen.de/cms/teer/Forschung/Forschungsschwerpunkte/~bmytzi/Emissionsminderung/>

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