



Research policy recommendations for **PFAS**



Research policy recommendations for PFAS

The current situation

The group of per- and polyfluoroalkyl substances (PFAS) comprises several thousand industrial chemicals that are used in a variety of industrial processes and products. The wide-spread use of these substances is due to the special physicochemical properties that the very stable carbon-fluorine bonds add to products. In the public discussion, PFAS are primarily associated with a variety of everyday products, such as casual clothing and outdoor textiles, coatings for frying pans and packaging, as well as paints, varnishes, fire-extinguishing agents, and cosmetics. PFAS play an equally crucial role in a wide range of high-tech processes and products in the fields of medical engineering, energy technology, photonics, semiconductor technology and more.

Apart from the manifold, sometimes unique technical benefits, PFAS have however detrimental effects on nature, the environment and (human) health. The toxicological effects on people and nature have been clearly demonstrated for a number of PFAS substances. Researchers have also irrefutably proven that various PFAS compounds accumulate and persist in drinking water, soil, food and organisms. Here, the high stability of the compounds is a disadvantage since they resist degradation, which is why the term “forever chemicals” has become common.

Due to their potential hazards, the European Chemicals Agency (ECHA) proposed banning the production, use and supply (including the import) of PFAS on February 7, 2023. The European Commission is expected to decide on this proposal in 2025, when further scientific assessments and public consultations will have been completed.

Our view of PFAS

Fraunhofer institutes are actively involved in assessing the toxicological effects of PFAS materials on people and the environment. Fraunhofer researchers are addressing topics such as detection analytics and the effects on the environment, on human health and on living organisms, and they are in close contact with the relevant authorities regarding regulatory issues. The environmental and toxicological problems presented by many PFAS compounds are undisputed in our view, which is why the Fraunhofer-Gesellschaft generally welcomes a ban on such compounds.

However, Fraunhofer also sees the need for extensive research and development that a far-reaching PFAS ban would entail. For a large number of processes and products, there are not yet any PFAS substitutes that offer comparable material properties for products. In addition, several potential substitutes still need to prove that they pose a lower risk to people and the environment. There will be a great need for research and development in adapting manufacturing and processing procedures if PFAS materials are to be substituted by alternative materials.

Especially in the field of renewable energies, but also in the strategically important chip industry, PFAS chemicals are part of established high-tech processes. Currently, without PFAS, neither the key technologies of the energy transition (electrolyzers, fuel cells, batteries, heat pumps) can be further developed and scaled up, nor can European research and production capacities in microelectronics be established. This is in direct contrast to the goals of the EU Chips Act with its billions of euros of investments.

For these reasons, the Fraunhofer Gesellschaft sees a far-reaching and hasty ban on PFAS compounds without mitigating measures to be a direct threat to the European energy transition, to Europe as a hub for industry and innovation and to European technological sovereignty.



Summary of our recommendation

Against this background, the Fraunhofer-Gesellschaft calls to take a nuanced view on the possibilities for substituting PFAS with other materials and sees the need for new processes and products to be developed for areas where substitution will not be possible in the foreseeable future. We see the implementation of closed-loop concepts both for the use of PFAS in manufacturing and processing and for the disposal of products containing PFAS as important and constructive measures. These must be initiated and supported by promoting European research and development activities in a clear and targeted manner.

The Fraunhofer-Gesellschaft

Based in Germany, the Fraunhofer-Gesellschaft is the world's leading applied research organization. Thanks to its focus on developing key technologies for the future and commercializing its findings in business and industry, it plays a major role in the innovation process. A trail-blazer and trendsetter in innovative developments and research excellence, it is helping to shape our society and our future. Founded in 1949, the Fraunhofer-Gesellschaft now operates 76 institutes and research units throughout Germany. Around 30,800 employees, predominantly scientists and engineers, work with an annual research budget of roughly 3.0 billion euros, 2.6 billion euros of which is designated as contract research (figures as of March 2023).

Contact

Dr. Stefan Löbbecke
Fraunhofer Institute for Chemical Technology ICT
Central office of the Fraunhofer Chemical Industry Alliance
Phone [REDACTED]
[REDACTED]@ict.fraunhofer.de