

Fact Sheet: Toxicity Assessment for PFBS

Federal, state, tribal, and local governments are working together to address per- and polyfluoroalkyl substances (PFAS) in the environment. PFAS are synthetic chemicals used in a wide range of products because of their ability to repel water, grease, and oil. EPA is announcing the finalization and posting of the toxicity assessment for perfluorobutane sulfonic acid (PFBS) and its potassium salt, potassium perfluorobutane sulfonate (K+PFBS), to increase the amount of information the public has on PFAS. The PFBS toxicity assessment can be used along with exposure information and other important considerations to assess potential health risks to determine if, and when, it is appropriate to address this chemical. The PFBS toxicity assessment adds to existing EPA health assessments of the legacy PFAS, perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS), which are no longer widely produced in the United States but may still be found in the environment.

Questions and Answers

What are PFAS?

PFAS: Per- and polyfluoroalkyl substances (PFAS) are a group of synthetic chemicals that have been in use since the 1940s and are (or have been) found in many consumer products like cookware, food packaging, and stain repellants. PFAS manufacturing and processing facilities, airports, and military installations that use firefighting foams are some of the main sources of PFAS. PFAS may be released into the air, soil, and water, including sources of drinking water. PFOA and PFOS are the most studied PFAS chemicals and have been voluntarily phased out by industry, though they are still persistent in the environment. There are many other PFAS, including PFBS in use throughout our economy.

PFBS: PFBS is a replacement chemical for PFOS, a chemical that was voluntarily phased out by the primary U.S. manufacturer by 2002. PFBS has been identified in the environment and consumer products, including surface water, wastewater, drinking water, dust, carpeting and carpet cleaners, and floor wax.

How are people exposed to PFBS?

People can be potentially exposed to PFBS through a number of different pathways, including contaminated drinking water, inhaling polluted air, and contact with PFAS containing products. EPA's final assessment for PFBS focuses solely on the potential human health effects associated with oral exposure; it does not consider potential cumulative (mixture) effects or possible interactions with other PFAS and/or other chemicals.

What health effects are associated with PFBS?

Animal studies have shown health effects on the thyroid, reproductive organs and tissues, developing fetus, and kidney following oral exposure. Based on information across different sexes, lifestages, and durations of exposure, the thyroid appears to be particularly sensitive to oral PFBS exposure. The data are inadequate to evaluate cancer effects associated with PFBS exposure.

What is an EPA toxicity assessment?

A toxicity assessment is part of the human health risk assessment process and is a written summary of the potential health effects associated with a chemical and identifies the exposure levels at which those health effects may occur. Specifically, the PFBS toxicity assessment covers the first two steps (Step 1. Hazard Identification and Step 2. Dose-Response) of the four-step risk assessment process developed by the National Academy of Sciences. Risk characterization, which is not done in these toxicity assessments, requires additional consideration of exposure. For more details about this process see: <https://www.epa.gov/risk/conducting-human-health-risk-assessment>.

The toxicity values from the PFBS assessment can be combined with specific exposure information (Step 3. Exposure Assessment) to help characterize the potential public health risks associated with exposure to this PFAS (Step 4. Risk Characterization).

The PFBS toxicity assessment is comparable to assessments developed under EPA's Integrated Risk Information System (IRIS) and Provisional Peer-Reviewed Toxicity Value (PPRTV) Programs; it provides hazard identification, dose-response information, and toxicity values. These types of toxicity assessments provide qualitative and quantitative toxicity information that can be used along with exposure information and other important considerations to assess potential health risks to determine if, and when, it is appropriate to take action to address this chemical. Although not an IRIS assessment, the PFBS toxicity assessment underwent a similar review process (EPA/Agency review, cross-federal agency/interagency review, public comment, and external peer review). The PFBS toxicity assessment is available for use across multiple EPA program and regional offices, other federal agencies, states, tribes, external stakeholders, and other entities as needed. One use of this assessment is to update and replace the existing 2014 PPRTV assessment for PFBS used by the EPA's Superfund Program.

EPA will continue to work with state, tribal, and local partners to provide technical assistance as they consider the final PFBS toxicity values in relevant exposure scenarios. After the full risk assessment process is completed, public officials can work to identify how to manage the identified risk. Under the risk assessment/risk management paradigm the supporting science, as well as statutory and legal considerations, risk management options, potential public health impacts, cost/benefit analyses, economic and social factors, and other considerations are evaluated and integrated. All users are advised to review the information provided in this document to ensure that the assessment is

appropriate for the types of exposures and circumstances in question and the risk management decisions that would be supported by the risk assessment.

What are the reference doses for PFBS?

As part of EPA's toxicity assessment, the agency has developed chronic and subchronic oral reference doses (RfDs) for PFBS. A reference dose is an estimate of the amount of a chemical a person can ingest daily over a lifetime (chronic RfD) or less (subchronic RfD) that is unlikely to lead to adverse health effects. EPA will continue to work with state, tribal, and local partners to provide technical assistance should they wish to use the final values with relevant exposure scenarios to develop risk assessments to support risk management decisions.

Chemical	Subchronic RfD	Chronic RfD
PFBS	0.001 mg/kg-day	0.0003 mg/kg-day

To learn more about EPA's risk assessment practices including development of toxicity values, please visit: <https://www.epa.gov/risk/conducting-human-health-risk-assessment>.

How does the toxicity of PFBS compare to PFOA and PFOS?

The RfD for PFBS suggests it is less toxic than PFOA and PFOS.

Toxicity is only one piece of information that public officials consider when determining whether there is a risk to public health. Other factors, such as exposure, must also be considered.

Chemical	Chronic RfD (mg/kg-day)
PFBS	0.0003
PFOA	0.00002
PFOS	0.00002

How might PFBS impact my drinking water?

If you are concerned about PFBS in your drinking water, EPA recommends you contact your local water utility to learn more about your drinking water and to see whether they have monitoring data for PFBS or can provide any specific recommendations for your community. PFBS typically comes from use of products containing PFBS and/or other PFAS that degrade to PFBS. This compound can migrate in the environment and impact the quality of surface water and groundwater which may be used as sources of drinking water. If you own a private well, EPA recommends learning more about how to protect and maintain your well for all contaminants of concern. For information on private wells visit:

www.epa.gov/privatewells.

What levels of PFBS did EPA find in the Unregulated Contaminant Monitoring Rule (UCMR) testing?

99.8 percent of water systems reported that they did not find PFBS in the UCMR 3 drinking water samples collected from 2013 through 2015. EPA found 8 out of 4,920 public water systems reported UCMR 3 results for PFBS at or above the minimum reporting level of 0.09 µg/L. EPA is proposing monitoring for more PFAS, including PFBS, at lower levels than was previously possible under the next UCMR (UCMR5). For more information on the UCMR visit: <https://www.epa.gov/dwucmr>.

Does EPA plan to issue a regulation for PFBS?

Not at this time. EPA is making the final toxicity assessment available to provide states, tribes, and local governments with the tools they need to better understand PFBS and to help inform whether local actions are needed to protect public health. To view the final toxicity assessment and other related information on PFBS, visit <https://www.epa.gov/pfas/learn-about-human-health-toxicity-assessment-pfbs>.