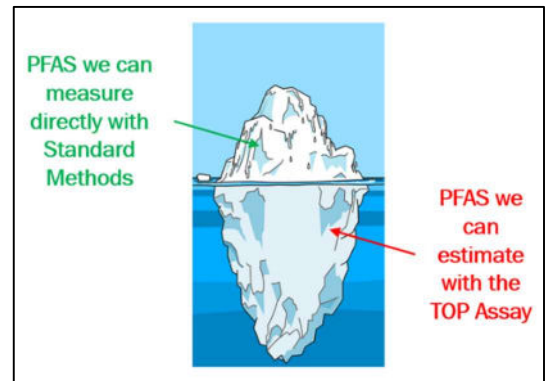


NewFields Note

PFAS Series: Total Oxidizable Precursor (TOP) Assay

NewFields Note: Technical information in a condensed, easily digestible format that is intended to promote environmental science education, knowledge transfer, and empowerment ... *one note at a time.*

A significant challenge with the analysis and interpretation of per- and polyfluoroalkyl substances (PFAS) is that standard methods are limited by the availability of commercial analytical standards and can therefore only measure up to approximately fifty of the *thousands* of potential PFAS structures. The analogy of an iceberg is an appropriate visualization: much like we only see the portion of iceberg above the water, standard methods only measure a fraction of the total PFAS structures that exist. However, many of the structures we cannot measure are *precursors* of structures we can measure, meaning they can be transformed, most often by oxidation, into measurable structures.



The **Total Oxidizable Precursor (TOP) Assay** is a tool for measuring the concentration of some PFAS precursors that cannot be measured in environmental samples. The value is two-fold: first, it can help identify source areas, and second, it demonstrates the presence of PFAS that may be an ongoing source of target PFAS to soil or groundwater. The TOP Assay is effectively a comparison of the concentration of measurable or "target" PFAS in a sample before and after oxidation: the difference represents the concentration of oxidizable precursors which may be particularly useful to identify source area/s. However, caution must be exercised with the interpretation of TOP Assay data:

1. TOP Assay is not quantitative: there is no way to know if all oxidizable precursors are converted to measurable PFAS or if any are lost during transformation.
2. TOP Assay is not a proxy for the formation of PFAS in the environment: while some of the oxidizable precursors will likely convert to PFAS over time in the environment, not all will.
3. TOP Assay is not a forensic tool: the distribution of PFAS after oxidation may not represent the distribution of perfluorinated chain lengths in the original sample.
4. Given subtle differences in how labs use standards to monitor the completeness of oxidation, it is best not to compare TOP Assay data from different labs: whenever possible, only compare TOP Assay data measured by the same laboratory.

For additional information, please contact your NewFields Technical Lead. Or send us an email at Science_Info@newfields.com!

