Total Organic Fluorine (TOF) Analysis for PFAS in Air

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Goals

- Addressing Program Office interest in developing tools for measurement of PFAS as a class
- Sufficiently sensitive method that is applicable to multiple source categories
- Evaluation of method applicability as screening tool and/or potential regulatory surrogate for PFAS emissions
- Tool to close mass balance of fluorine (HF, targeted PFAS, nontargeted/unknown PFAS), especially in evaluation of destruction technologies
- Combustion ion chromatography (CIC) is most likely candidate for a “total PFAS” method

Approach

- Evaluating sampling approaches for efficient capture across PFAS classes
  - Volatiles/semi-volatiles; polar/nonpolar PFAS
  - E.g., carbons, resins, impinger (aqueous), whole air sampling
- Methods must exclude, eliminate, or account for inorganic fluorine (F^-, HF) prior to TOF analysis
- Assessing sufficiency of sensitivity for applications
- Validating sampling/combustion methods
  - Recovery of spiked gaseous PFAS standards
  - Mass balance of PICs + HF in PFAS standard destruction experiments

Current Status

- CIC method for TOF air measurements in early stages of development
- Evaluating instrument/analytical capabilities
  - Sensitivity, accuracy, precision
  - Recovery of PFAS standards in combustion; class trends?
  - Sample introduction options
- Evaluating sampling options
  - Identifying candidate sorbents
  - Impingers from OTM-45 train
  - Direct measurement, whole air
  - Developing gaseous PFAS capabilities

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