**PTFE vs. PFOA**

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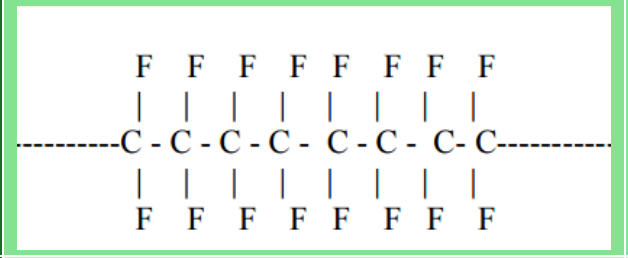
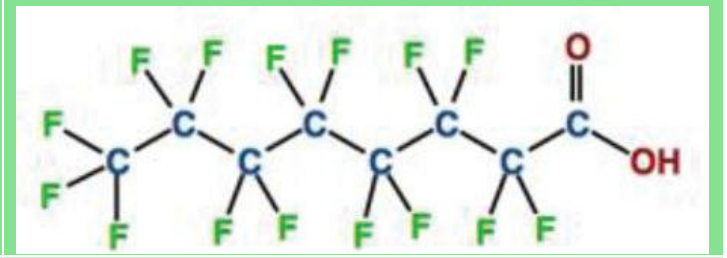
The definition of PFAS includes an estimated 14,000 molecules and compounds that significantly vary in their physiochemical properties and should not be regulated in the same manner. For example, PTFE and PFOA have different chemical structures and properties (see chart below). PTFE is a stable, inert, non-polar polymer mainly used for its chemical resistance and non-stick properties, while PFOA is a bioaccumulative, amphiphilic surfactant with environmental mobility concerns and has been phased-out due to its potential health risks.

Below are a few examples of the broad agreement on this scientific fact:

- Department of Defense report states "A variety of broad molecular structure descriptors, without regard to the individual substance's toxicity profile and hazard characterization, are used to define the chemical class "PFAS." These structural definitions do not inform whether a substance is harmful but only communicate that the substances share common structural traits to varying degrees."
- EPA's National PFAS Testing Strategy states "Most of the hundreds of PFAS currently in commerce have limited or no toxicity data."
- Organisation for Economic Co-operation and Development (OECD) issued a report stating, "As PFASs are a chemical class with diverse molecular structures and physical, chemical and biological properties, it is highly recommended that such diversity be properly recognized and communicated in a clear, specific and descriptive manner. The term "PFASs" is a broad, general, non-specific term, which does not inform whether a compound is harmful or not, but only communicates that the compounds under this term share the same trait for having a fully fluorinated methyl or methylene carbon moiety."
- Canada PFAS risk management approach excludes fluoropolymers.

| Property | PTFE | PFOA |
|---|---|---|
| Chemical Structure | Linear polymer composed of repeating (can be thousands) tetrafluoroethylene monomers - $(CF_2\text{-}CF_2)n$  | 8-carbon chain fully fluorinated except for the last carbon which is attached to a carboxylic acid group - $C_8HF_{15}O_2$  |
| Water Solubility | Insoluble | Soluble |
| Mobility in Environment | Stable and does not dissolve or migrate easily in the environment due to its solid form and chemical inertness | Can move through soil and water due to its solubility and persistence in the environment |
| Bioaccumulation | Not bioaccumulative; it is inert and does not absorb into living tissues | Highly bioaccumulative; it tends to persist in biological systems, accumulating over time and potentially causing health issues |
| Polarity | Non-polar | PFOA is considered amphiphilic because it has both hydrophobic (non-polar) and hydrophilic (polar) parts |
| **Toxicity** | Inert and non-toxic; does not react with other chemicals easily and poses minimal risk under normal conditions | Toxic |