Perfluorinated compounds are organic chemicals in which all hydrogen molecules of the carbon-chain are substituted by fluorine molecules. Generally, there are two types of perfluorinated compounds, the perfluoroalkanes that are primarily used clinically for oxygenation and respiratory ventilation, and the perfluoroalkyl acids (PFAAs). Environmentally relevant PFAAs are a family of about 30 chemicals that consist of a carbon backbone typically 4-14 molecules in length and a charged functional group composed of either sulfonates, carboxylates or phosphonates (and to a lesser extent, phosphinates). While many (>100) derivatives of PFAAs (such as alcohols, amides, esters and acids) are used for industrial and consumer applications, they can be degraded or metabolized to PFAAs as end-stage products. Thus, PFAAs, rather than their intermediates or derivatives, have drawn the most public attention and research interest. The most widely known PFAAs are the eight-carbon (C8) sulfonate (perfluorooctane sulfonate, PFOS) and carboxylate (perfluorooctanoic acid, PFOA), although the C4 (perfluorobutane) and C6 (perfluorohexane) sulfonates, as well as the C4, C6 and C9 (perfluorononanoic) carboxylates have also been used in commerce. The perfluoroalkyl phosphonates (PFPAs) are fairly new entities for this class of chemicals. They are typically used as leveling and wetting agents, and defoaming additives in the production of pesticides. They were considered biologically inert by the U.S. Environmental Protection Agency (US EPA) until 2006 [1]. The chemical structures of PFPAs resemble those of perfluorocarboxylates (PFCAs) and perfluoroalkyl sulfonates (PFASs), but unlike PFCAs and PFASs, PFPAs include both mono- and di-substituted congeners. In typical industrial and commercial applications, these chemicals are composed of a mixture of these congeners. For example, the fluorosurfactant cleaning product Masurf-