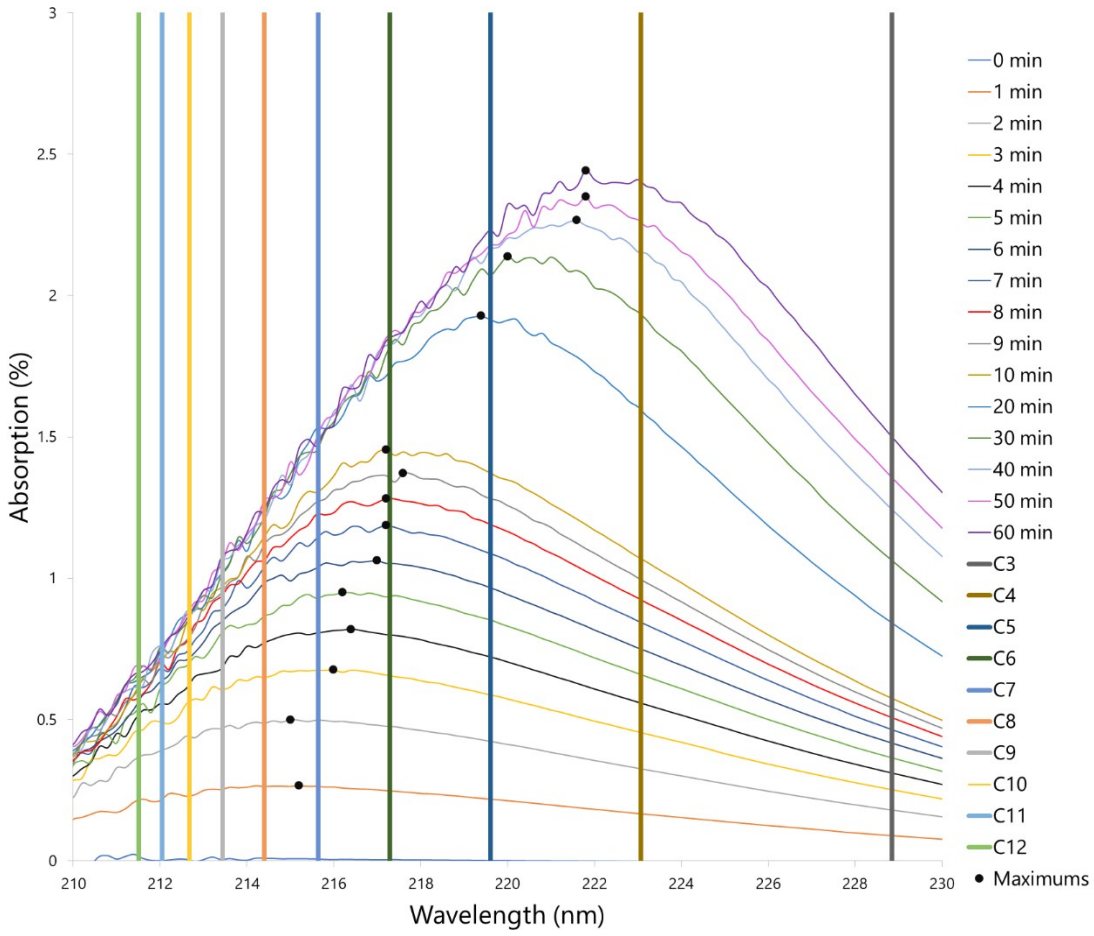
Supplementary Materials

PFAS Compound (Purity)	Acronym	Formula	CAS	Manufacturer
Perfluoropentanoic acid (97%)	PFPeA	$C_5HF_9O_2$	2706-90-3	Sigma-Aldrich
Perfluorohexanoic acid (98%)	PFHxA	$C_6HF_{11}O_2$	307-24-4	ChemScene
Perfluorooctanoic acid (96%)	PFOA	$C_8HF_{15}O_2$	335-67-1	Sigma-Aldrich
Perfluorononanoic acid (97%)	PFNA	$C_9HF_{17}O_2$	375-85-9	Sigma-Aldrich
Perfluorodecanoic acid (98%)	PFDA	$C_{10}HF_{19}O_2$	335-76-2	Sigma-Aldrich
Perfluorotridecanoic acid (97%)	PFTrDA	$C_{13}HF_{25}O_2$	72629-94-8	Sigma-Aldrich
Perfluorobutanesulfonic acid (97%)	PFBS	$C_4F_9SO_3$	375-73-5	ChemScene
Perfluorohexanesulfonic acid potassium salt (98%)	PFHxS	$C_6F_{13}SO_3K$	355-46-4	Sigma-Aldrich
Perfluorooctanesulfonic acid potassium salt (98%)	PFOS	$C_8F_{17}SO_3K$	1763-23-1	Sigma-Aldrich
1H,1H,2H,2H-Perfluorohexanesulfonic acid (98%)	4:2 FtS	$C_6H_5F_9SO_3$	757124-72-4	SynQuest Labs
1H,1H,2H,2H-Perfluorooctanesulfonic acid (98%)	6:2 FtS	$C_8H_5F_{13}SO_3$	27619-97-2	SynQuest Labs
1H,1H,2H,2H-Perfluorodecanesulfonic acid (98%)	8:2 FtS	$C_{10}H_5F_{17}SO_3$	39108-34-4	SynQuest Labs

S1 Analyte list of PFAS compounds tested in this study and presented in this manuscript. Suppliers were selected based on high purity of the compounds so single analyte tests could be effectively conducted.



S2 Typical UV-Vis analysis over the time course of GAP system for PFOA at 0.1 mg/L initial concentration. This analysis method is a qualitative method while the RPLC-IC, LC/MS/MS and QTOF methods are quantitative methods. As seen in S3, there are increases in shorter chain lengths measured from a quantitative (LC/MS/MS) method, in agreement with the qualitative UV-vis analysis method.

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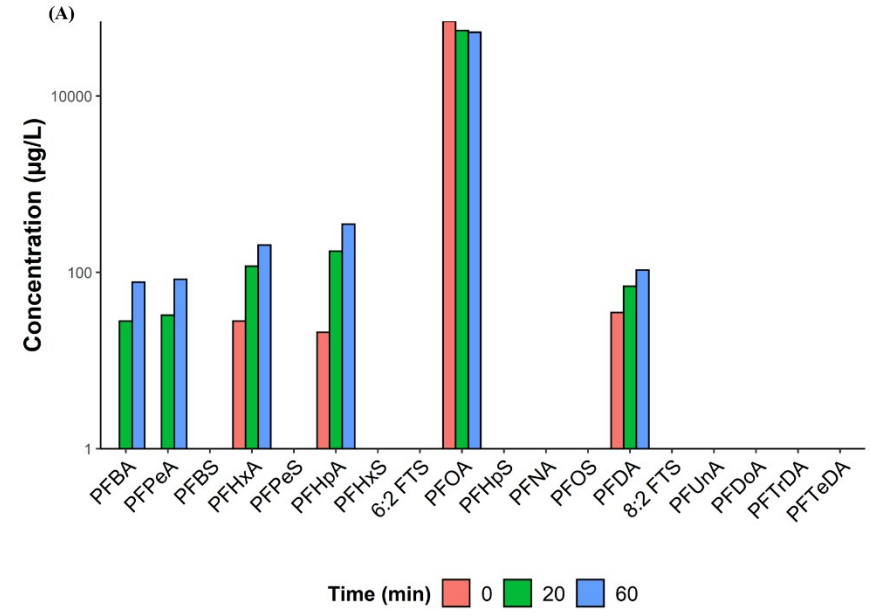
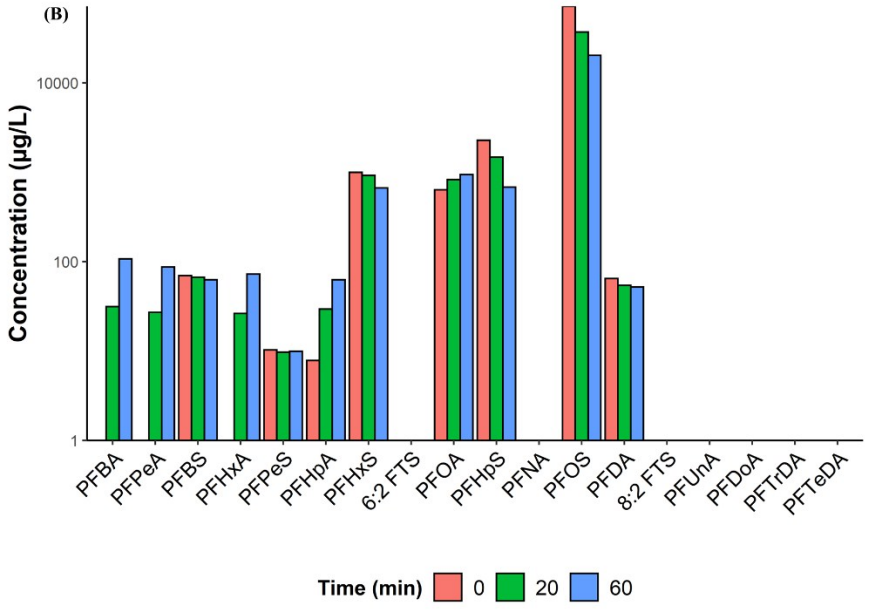
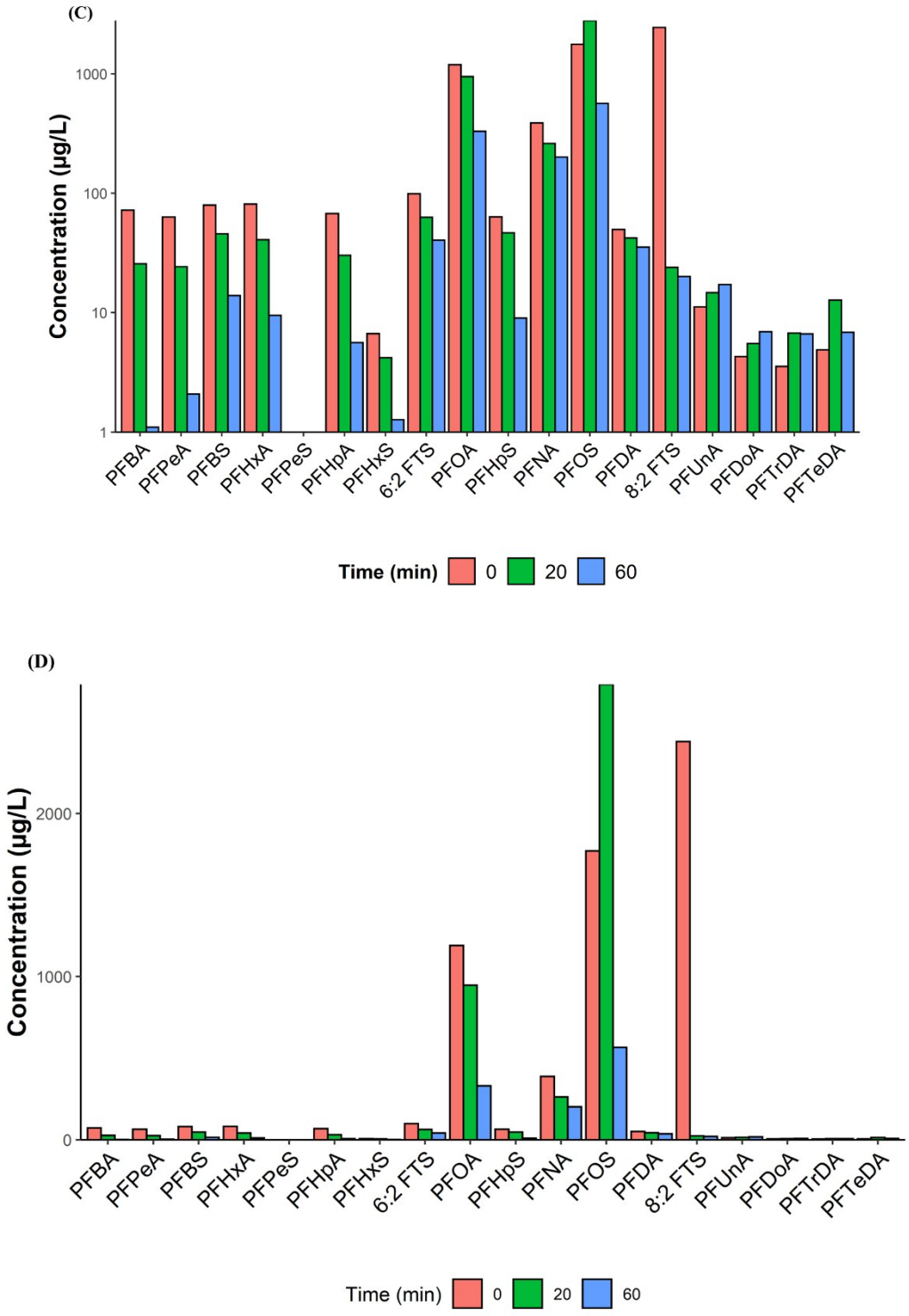
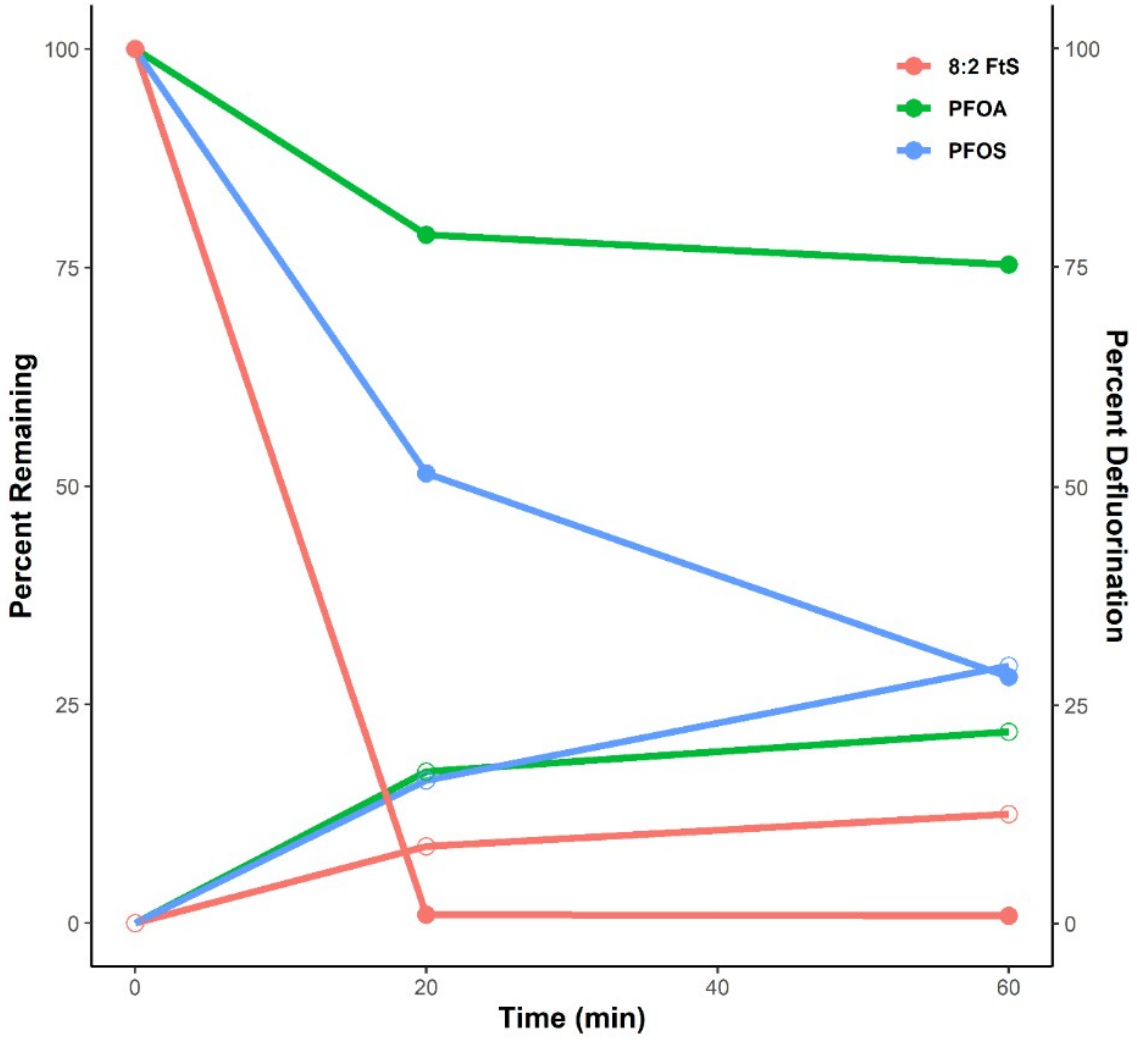

(A)
Concentration (µg/L)
10000
100
1
PFBA
PFPeA
PFBS
PFHxA
PFPeS
PFHpA
PFHxS
6:2 FTS
PFOA
PFHpS
PFNA
PFOS
PFDA
8:2 FTS
PFUnA
PFDoA
PFTrDA
PFTeDA
Time (min)
0
20
60

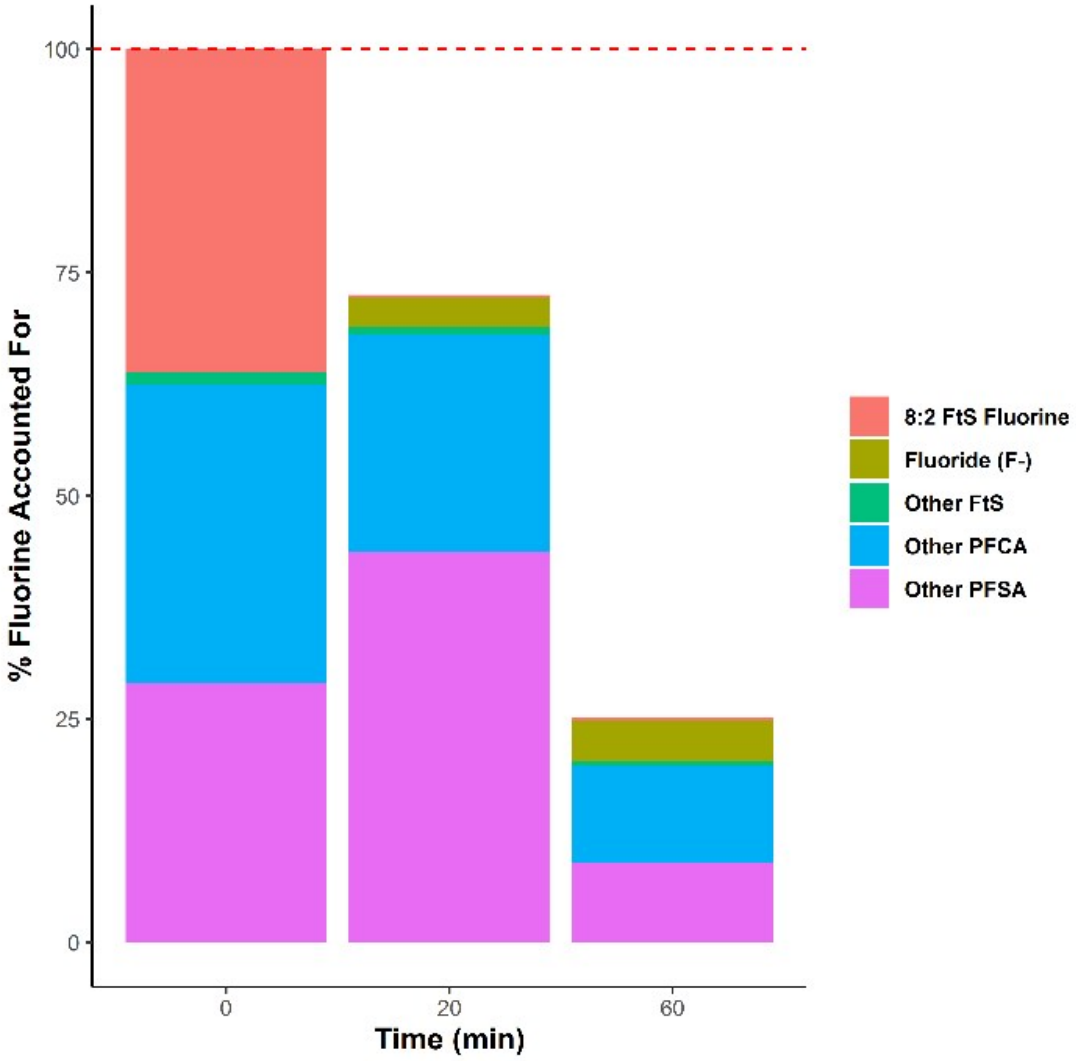

(B)
Concentration (µg/L)
10000
100
1
PFBA
PFPeA
PFBS
PFHxA
PFPeS
PFHpA
PFHxS
6:2 FTS
PFOA
PFHpS
PFNA
PFOS
PFDA
8:2 FTS
PFUnA
PFDoA
PFTrDA
PFTeDA
Time (min)
0
20
60



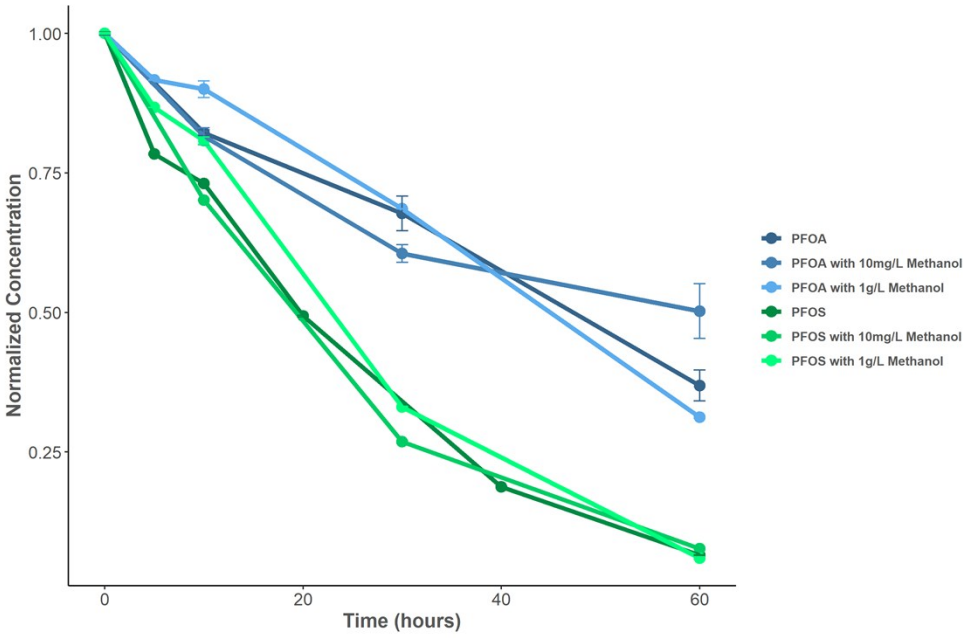
S3 Vista Byproducts. (a) Log Scale PFOA, (b) Log Scale PFOS, (c) Log Scale mixed system and (d) mixed system. Experiment was run for 1 hour of treatment time, 150 W power setting, and 50 L/min air. Data displayed was measured by LC/MS/MS.



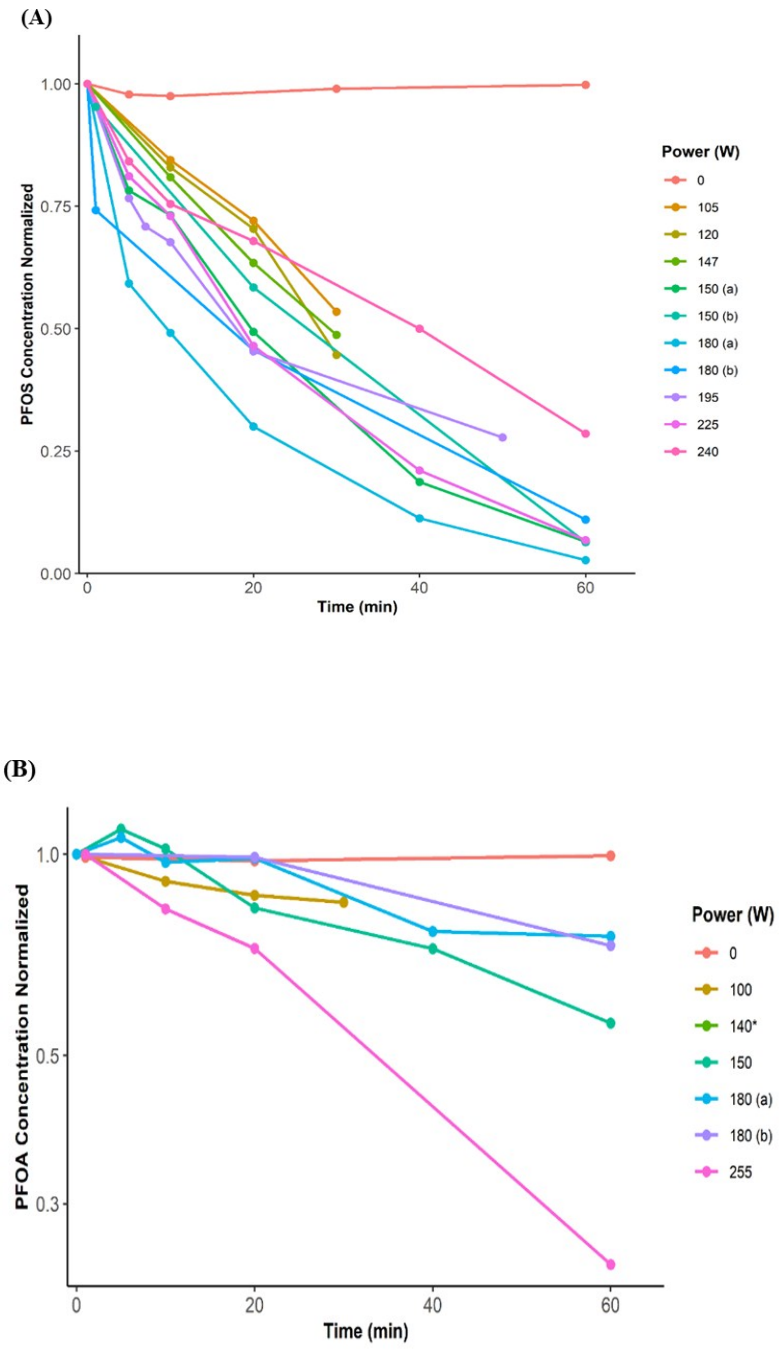
S4. Destruction and defluorination of 8:2 FtS, PFOA, and PFOS over time. Experimental conditions: 50 L/min air flow, 150 W power output setting, 1 hour of treatment time. Compound fluorine remaining was determined by calculating the amount of fluorine in the PFAS added and subtracting the amount of fluorine measured in the water throughout treatment sampling. Concentrations reported were measured by LC-MS/MS method.



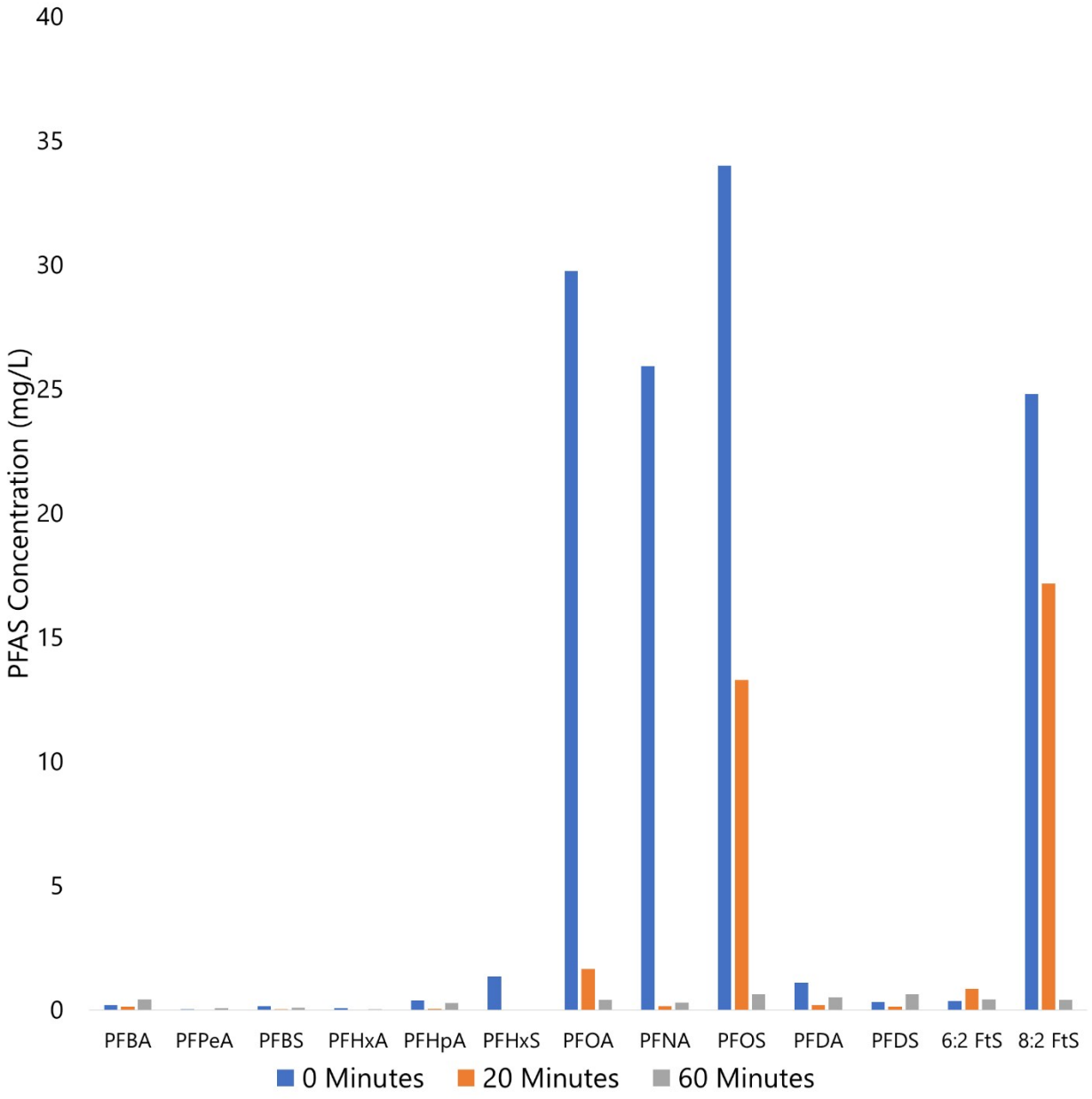
S5. Fluorine mass balance of mixed 8:2 FtS batch experiment. PFAS were measured using LC-MS/MS method. Free fluorine ions were measured using the fluoride selective probe.



S6. Organic matter interference on GAP treatment. PFOA solutions dissolved in milli-Q water at ~100 mg/L were spiked with methanol at 10 mg/L or 1000 mg/L. GAP was run with 50 L/min air, 1 hour of treatment time, and 150 W power setting.



S7. Destruction of (a) PFOS and (b) PFOA in GAP system overtime. Experiments were run at ~100 mg/L, 50 L/min air flow, and at one hour durations.



S8. Example of QTOF Analysis for time series GAP treatment of mixed PFAS contaminated water. QTOF Analysis was performed to further validate LCMS/MS results and to develop a procedure for future studies.