

Nontarget LC/QToF Interrogation of Fluorinated Residues in a Fluoropolymer Dispersion Prepared with a Hydrocarbon based Processing Aid

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Fluoropolymers have critical applications in numerous industries. Emulsion polymerization of fluoropolymers utilizes a polymerization processing aid (PA) and recent regulatory focus around per- and poly-fluorinated alkyl substances has increased attention on manufacturers switching from perfluorinated to non-fluorinated hydrocarbon PAs. High resolution Liquid Chromatography with tandem mass spectrometry, i.e. Triple Quadrupole (LC/QqQ) or Quadrupole Time of Flight (QToF) detection, has been utilized to interrogate an aqueous polytetrafluoroethylene (PTFE) dispersion prepared using dioctyl sulfosuccinate (DOSS) as a hydrocarbon based PA. Targeted LC/QqQ measurement indicates no measurable perfluorocarboxylic or sulfonic acids on the EPA Method 537 analyte list. Compounds with near identical structure, however, could be present but not detected including H-capped carboxylic or sulfonic acids, diacids, etc. Nontarget interrogation also indicates polyfluorinated analytes and residues indicative of reactions of DOSS with TFE. Targeted investigations are, therefore, limited and additional polyfluorinated residues can exist requiring non-targeted methods to elucidate the full residual profile.