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Rapid Precipitation of Dissolved Solids in Micro-L Drops For Rapid, Small Volume Composition Analysis via InnovaDrop^{TM}of Rain Pollution using Timed Sampling AARUSH THINAKARAN, RAHIL SHAH, TANVI SATHISH, SHREYASH PRAKASH, VISHWESHWAR SWAMINATHAN, KARISHMA SIVAKUMAR, Arizona State University, Dept. of Physics, NIKHIL SURESH, MicroDrop Diagnostics LLC., MOHAMMED SAHAL, LAUREN PUGLISI, SiO2 Innovates LLC., ROBERT CULBERTSON, Arizona State University, Dept. of Physics, NICOLE HERBOTS, SiO2 Innovates LLC., INNOVADROP TEAM — Totally Dissolved Solids (TDS) in water include metals Pb, As, radionuclides (Sr) along light elements (S, K, Mg, Ca, Na, Cl), due to growing pollution and climate change.This work studies a new, cheap, safe, rapid method to identify TDS in water, InnovaDrop [1], which needs only drops as samples. InnovaDrop aims for accuracy and reproducibility of +/-10% via rapid precipitation of drops into Homogeneous Thin Solid Films (HTSF), using new hyper-hydrophilic polymer PhiloDrop [1] on microscope slides. HTSFs are safe to store and transport, and can be analyzed in mins by hand-held X-Ray Fluorescence (XRF). Drops from water samples pipetted on InnovaDrop, absorb rapidly PhiloDrop so TDS precipitate into HTSF for XRF elemental analysis. XRF accuracy and reproducibility is achieved with HTSF of pre- solidified metered drops of calibration solutions. Present methods cannot be deployed as rapidly during a catastrophe such as wildfires, floods, or cooling water leaks from nuclear plants or mines. InnovaDrop yields results in 30 mins. [1] Herbots, Thinakaran Int. & US Pat. Pend. (2020)

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