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Rapid Solidification of Micro-L Blood Drops Into Homogeneous Thin Solid Films: A New Device, InnovaStrip, for Fast, Accurate, Comprehensive Small Volume Blood Diagnostics via Ion Beam Analysis and X-Ray Fluorescence WESLEY PENG, THILINA BALASOORIYA, NIKHIL SURESH, AASHI GURIJALA, MOHAMMED SAHAL, Arizona State University, Dept. of Physics, AMBER CHOW, SHAURYA KHANNA, LAUREN PUGLISI, SRIVATSAN SWAMINATHAN, ABBIE ELISON, MicroDrop Diagnostics, LLC, ERIC CULBERTSON, Ronald Reagan UCLA Medical Center, ROBERT CULBERTSON, NICOLE HERBOTS, Arizona State University, Dept. of Physics, INNOVASTRIP RESEARCH COLLABORATION — Blood Diagnostics (BD) analyzes 1-10 mL of liquid blood in hrs to days. BD leads to greater than 80% rates of Hospital-Acquired Anemia - a serious illness for cancer patients and premature infants. In this work, a new, Small Volume BD device, InnovaStrip[1], rapidly solidifies blood drops into flat, Homogeneous Thin Solid Films (HTSF). Hyper-hydrophilic HemaDrop[1] coatings on InnovaStrip[1] are optimized via micro-fluidics to yield HTSFs fit for solid state analysis. HTSFs undergo Ion Beam Analysis and X-ray Photoelectron Spectroscopy in vacuo and X-ray Fluorescence (XRF) in air without significant radiation damage. They yield electrolytes and metals levels in min. with accuracy and reproducibility to +/-10%. Hand-held XRF can be used at Point-of-Care. Built-in HTSFs from calibration solutions on InnovaStrip[1] benchmark HTSF and conversion of atomic % into mg/dL, a key unit for BD. InnovaStrip[1] yields comprehensive BD using micro-Ls instead of mLs of blood. [1] Herbots, Suresh, Peng *et al.* Int. US. Pat. Pend (2020).

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