Abstract Submitted
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HemaDrop: A Technology to Determine Accurate Blood Composition via Homogeneous Thin Solid Films from Microliter Drops of Blood[1] Y.W. PERSHAD, Ariz. St. Univ., Physics Dept., N. HERBOTS, Ariz. St. Univ., Physics Dept./SiO2 Innovates, A.O. MARTINEZ, S.M. SUHARTONO, R.J. CULBERTSON, H. THINKARAN, A.P. KRISHNAN, Ariz. St. Univ., Physics Dept., M.W. MANGUS, JR., B.J. WILKENS, Ariz. St. Univ., LeRoy Erying Cent. for Solid State Sciences — Accurate, near real-time analysis of blood can improve medical diagnostics and forensics. Critically and chronically ill patients, premature infants, and children can contract anemia due to the 7 milliliter blood volumes drawn currently. Nanoliter blood analysis lacks accuracy mandated by the FDA and physicians, with errors >10%, and lack of support by publications or patents. HemaDrop^{TM}[1,2] rapidly congeals microliter blood droplets in smooth Homogenous Thin Solid Films (HTSF) without phase separation. HemaDrop^{TM}uses hyper-hydrophilicity [1] to solidify fluids, enabling blood analysis in vacuo with Ion Beam Analysis (IBA). Rutherford Backscattering Spectrometry, Particle- Induced X-Ray Emission, and damage curve methods [2] determine blood composition for C, N, O, Na, K, Ca, Cl, Fe and account for IBA damage. Accuracy and reproducibility of blood electrolyte composition is better than 5%. Optical microscopy compares real-time blood solidification, phase separation, and surface roughness for HemaDrop^{TM}HTSFs and conventional drying. 1. Int&US Pat. Pend. 2016, 2. MRS Advances 2016

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