Abstract Submitted
for the DFD20 Meeting of
The American Physical Society

Effects of Dilution on Multi-component Drying Droplets
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— Bio-colloidal systems exhibit a variety of structural and functional complexity due to their ability to interact between different components. Understanding the multi-component self-assembling system, such as blood, is crucial for designing self-assembled structures with a multidisciplinary impact. This paper presents an experimental investigation that explores the whole human blood by a more in-depth understanding of the drying process involved under different dilution conditions with de-ionized water. Our results show that textural image parameters could characterize the drying stages. The parameters are acquired from the distribution of the pixel values, and their inter-spatial arrangements reveal the complexity, heterogeneity, and smoothness of the drying droplets. Consequently, a decrease in the initial blood concentration results in the disappearance of a late time feature in the contact angle dynamics. This transition is also evident in the dried morphology, where the crack width and spacing exhibit a change in their slope values. A combination of optical and scanning electron microscopy confirms how the dilution changes the initial native state by reducing the interaction between the constituent particles and minimizing their biological activities.

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Date submitted: 03 Aug 2020 Electronic form version 1.4