

PREDICTION OF LONG AND SHORT TIME RHEOLOGICAL BEHAVIOR IN SOFT GLASSY MATERIALS

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When a jammed colloidal system is subjected to a stimulus, the response generated is not only dependent on the time (t) for which the stimulus is applied but also on an aging time (or waiting time) of the sample. Such behavior causes failure of time - translational invariance. In this work we present an effective time approach to predict long and short time rheological behavior of soft glassy materials from experiments carried out over practical time scales. Effective time approach takes advantage of relaxation time dependence on aging time that allows time-aging time superposition even when aging occurs over the experimental timescales. Interestingly experiments on variety of soft materials demonstrate that the effective time approach successfully predicts superposition for diverse aging regimes ranging from sub-aging to hyper-aging behaviors. This approach can also be used to predict behavior of any response function in molecular as well as spin glasses.