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Rheology of Concentrated Colloidal Suspensions in the Approach of the Glass Transition HORST WINTER, NSF, MIRIAM SIEBENBUERGER, MATTHIAS BALLAUFF, Helmholtz-Zentrum Berlin, Germany — Concentrated, non-crystallizing colloidal suspensions in their approach of the glass state exhibit distinct dynamics patterns. This is demonstrated with a model suspension at increased volume fraction of solid. The glass is defined by arrested motion of the spherical suspension particles. Dynamic mechanical experiments suggest a powerlaw rheological constitutive model for near-glass viscoelasticity as presented here. The rheological parameters used for this model originate in the Mode-Coupling Theory. The proposed constitutive model provides explicit expressions for the steady shear viscosity, the steady normal stress coefficient, the modulus-compliance relation, and the α-peak of G". The relaxation pattern distinctly differs from gelation.

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