What can we learn about strong and fragile glasses from the study of patchy colloidal particles?

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Abstract:

Recent investigations about the phase behaviour of limited valence colloids have revealed that, different from simple colloidal fluids where at low temperature phase separation competes with glass formation, network forming colloids can be cooled down to low temperatures in homogeneous states even at moderate densities[1]. These studies have unexpectedly disclosed strong connections between gel forming colloids and strong network forming liquids[2].

In the last years we have also started to examine the crystallization process of tetrahedrally coordinated colloidal particles[3,4]. These studies have provided evidence that for patchy colloids with limited valence, conditions can be found for which the liquid network phase is stable even in the zero-temperature limit. Apparently, the network liquid state can be thermodyanmically more stable than the ordered crystal state and thus the liquid never crystallizes.

Are these conditions relevant also for understanding the glass-forming ability of atomic and molecular strong glass formers [5]?

References:

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