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(I) Multi-tunable colloids with dipolar and depletion interactions

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Colloids are mesoscopic particles that enable a systematic study of inter-particle interactions in soft materials. The depletion interaction is an attractive effective interaction that can be tuned by polymer additives, while the amplitude and frequency of an external electric field can be used to tune the dipolar interaction. Using these two interactions simultaneously, we create multi-tunable colloids where weak depletion results in increase crystalline order while stronger depletion increases disorder and results in novel gel states [1]. With these “dipolar-depletion” gels, we examine the onset of irreversibility and find strategies to accelerate aging.

[1] Shivani Semwal, Cassandra Clowe-Coish, Ivan Saika-Voivod, Anand Yethiraj, “Tunable colloids with dipolar and depletion interactions: towards field-switchable crystals and gels.”, *Physical Review X* 12, 041021 (2022).

Keyword-1

multi-tunable colloids

Keyword-2

dipolar depletion

Keyword-3

switchable gels

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