Electronic Supplementary Material (ESI) for Soft Matter.

Self-Assembly of Magnetic Colloids with Radially Shifted Dipole

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Figure S1 shows the mean average cluster size for values from s = 0.0 to s = 0.8, it can be clearly observed that there are three very marked separations of the power low which correspond to the three aggregation regions. The bonded particle orientation distribution function is also shown, where the differentiated orientation trends for the face of the aggregation region are clearly observed.

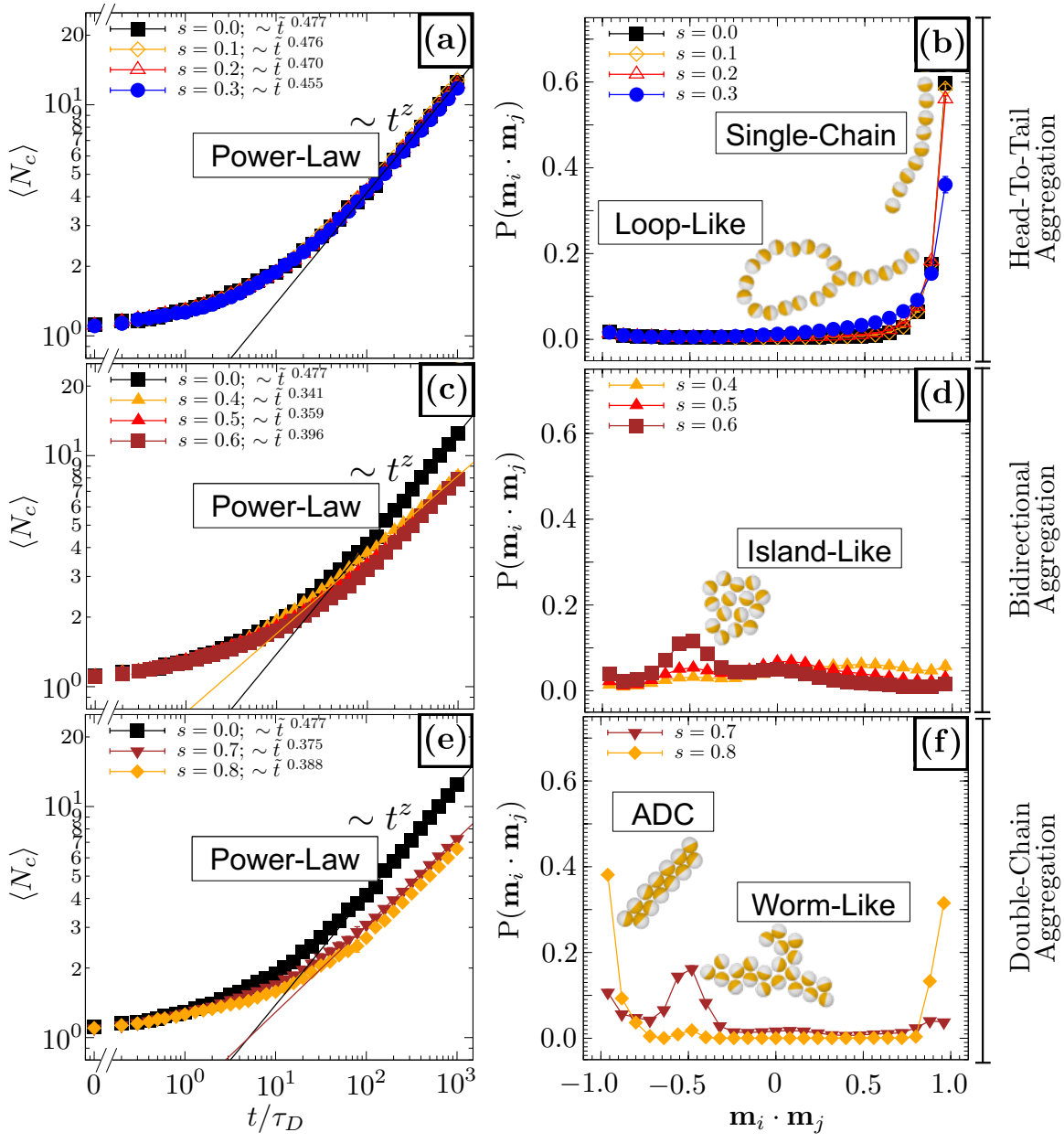

Fig. S1. Time evolution of average cluster size and Bonded particle orientation distribution functions at λ = 45 (HLR)

Figure S2 shows the magnetic potential given by the interaction between the magnetic dipoles of two neighboring particles versus the distribution of orientations in the ground state. It can be differentiated from the behavior of the curbs that there are three differentiated behaviors, for s = 0.0 as = 0.3 the minimum energy is located in the orientation equal to 1.0, this corresponds to heat-to-tail aggregation, for s = 0.4 as = 0.6 the minimum energetic is between the orientations -0.5 and 0.5, the curve has a smooth behavior so that the energy variation is minimal if the particles meet at close angles to the minimum, this corresponds to bidirectional aggregation, for s = 0.7 as = 1.0 the minimum energetic is between the orientations -1.0 to -0.5, the curve has a pronounced minimum where the particles can not be maintained in a stable way in different angles to the minimum, this corresponds to double-chain aggregation.

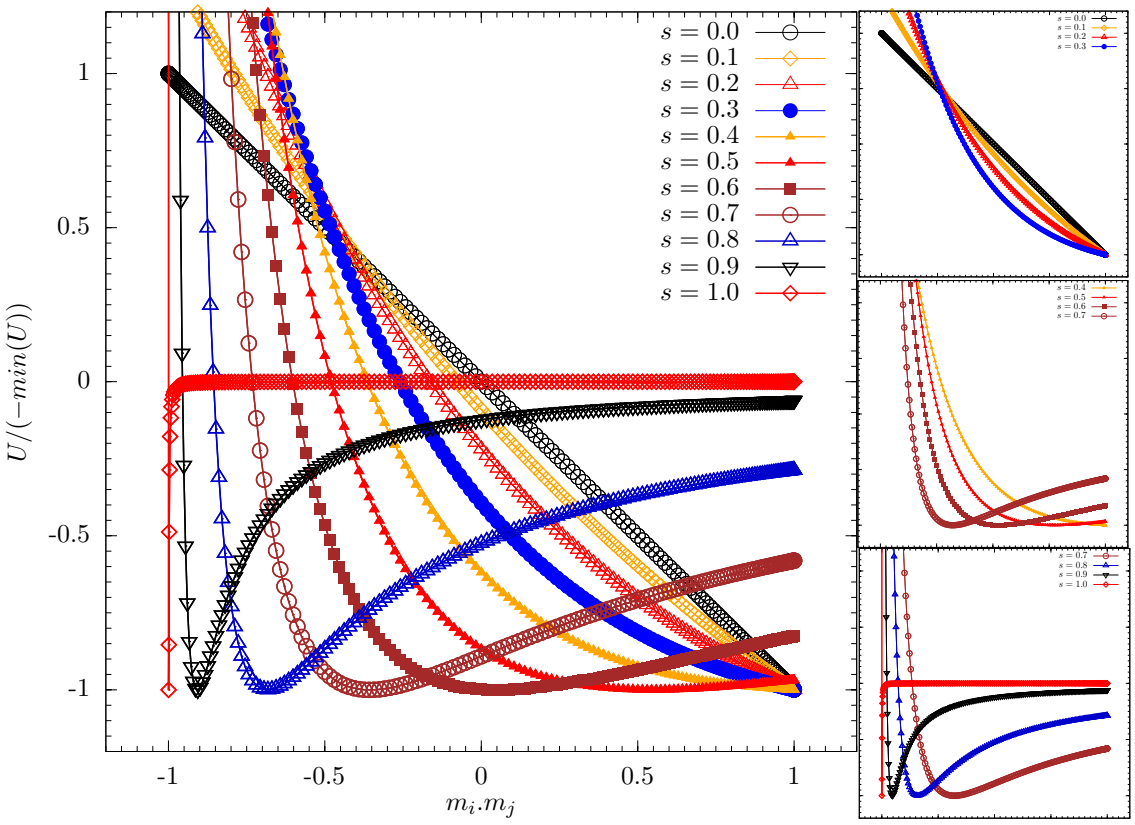

Fig. S2. Bonded particle orientation distribution functions for duplets in ground state

Videos of magnetic Janus particle aggregation

Video Information:

Each video is titled lXX_sYYY.mov, where XX corresponds to the dipolar coupling constant and YYY to the dipolar shift of the particles present in the video. All systems start with random initial positions and orientations, and have a ϕ_s = 0.01.