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Entangled fractal clusters forming the lattice animals in irreversible DLCA binary systems ZAKIYA SHIREEN, SUJIN BABU, Indian Institute of Technology Delhi, New Delhi, India — Irreversible DLCA of binary spheres was simulated by modifying the Brownian Cluster Dynamics. Volume fraction of randomly distributed N spheres in a box of size L is given by $\Phi_{tot} = \frac{\pi}{6} N_{tot}/L^3$. N_A and N_B number of spheres of same size are defined as species A and B. Intra-species form irreversible bonds, while inter-species interaction is through hard core repulsions. We kept $N_B \geq N_A$, and observed bigel for certain fraction of A species. By tuning the Φ_{tot} and fraction of A and B species we were able to regulate the size of the cage and designed clusters of a specific size. We found that the accessible volume of the system increases when compared to the monomeric case, which means that species A is aggregating inside the cage created by B. Unlike monomeric DLCA we observe that for moderate Φ_{tot} both the species undergo a transition from lattice animal(fractal dimension,$d_f = 2.0$) to the percolation region($d_f = 2.5$). We found that A clusters are stuck inside the B percolating cluster and always have a fractal dimension of 2, thus having 2 characteristic length scale for binary system. Also, diffusion of one species are hindered by the presence of the other species forming cages.

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