changes and deformation process. It was observed that the shape of the stress-strain curve of TiO_2 coated wool fibers became the same as uncoated wool fibers and showed a similar tendency of change to uncoated wool fibers with increasing temperature. The TiO_2 coated wool fibers became stronger and obtained higher rigidity than uncoated wool fibers. Although the breaking extension of TiO_2 coated wool fibers decreased little, the Young's modulus of TiO_2 coated wool fibers increased and remained relatively higher than that of uncoated wool fibers after thermal treatments. Structural changes due to thermal effect on both uncoated and TiO_2 coated wool fibers were discussed.

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Relaxation properties in randomly diffusive model of k-mers on a triangular lattice

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We study the relaxation process in a two-dimensional lattice gas model, based on the concept of geometrical frustration. In this model the particles are k-mers which can both randomly translate and rotate on the planar triangular lattice. In the absence of rotation, the diffusion of hard-core particles in crossed single-file systems is investigated. We monitor, for different densities, several quantities: mean square displacement, the self-part of the van Hove correlation function, and the self intermediate scattering function. We observe a considerable slowing down of diffusion on a long-time scale when suppressing the rotational motion of k-mers; our system is subdiffusive at intermediate times between the initial transient and the long-time diffusive regime. We show that the self-part of the van Hove correlation function exhibits, as a function of particle displacement, a stretched exponential decay at intermediate times. The self intermediate scattering function (SISF), displaying slower than exponential relaxation, suggests the existence of heterogeneous dynamics. For each value of density, the SISF is well described by the Kohlrausch-Williams-Watts law; the characteristic timescale t(qn) is found to decrease with the wave vector qn according to a simple power-law. Furthermore, the slowing down of the dynamics with density ?, is consistent with the scaling law 1/ t (qn; ?$_0$) R*(?$_c$- ?$_0$)$^?$, with the same exponent ? = 3.34 ± 0.12 for all wave vectors qn. The density ?$_c$ is approximately equal to the closest packing limit, ?$_{CPL}$ ~ 1, ?$_{CPL}$ < 1 for dimmers on the two-dimensional triangular lattice. The self-diffusion coefficient Ds scales with the same power-law exponent and critical density.

Keywords: lattice gas model, subdiffusion, microporous materials

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S4_P25

THE EVOLUTION OF HOMOGENEITY IN PROCESSING BY EQUAL CHANNEL ANGULAR PRESSING (ECAP)

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