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Cuvillier Verlag Aug 2012, 2012. Taschenbuch. Condition: Neu. Neuware - This dissertation describes first and fundamental studies of sedimentation processes of various fibre-particle suspensions. The settling behaviour of such suspensions is investigated experimentally and by numerical simulations under consideration of different parameters. Thus correlations were seen between academic fibre and fibre-particle suspensions and those obtained from the paper recycling industry, as well as in comparison with calculations. For the simulations the method Stokesian Dynamics has been reformulated. This method was derived with help of the Stokes equations in an exterior domain and the Newton's laws of motion for the movements of the particles. The Stokes equations are used to approximate detailed hydrodynamic forces between particles without solving the entire velocity and pressure field. Thus, it enables calculations of complete sedimentation processes and the microscopic behaviour of particles under consideration of hydrodynamic interactions and the influence of the gravity of earth. Additionally, during the derivation special interest was paid to the assumptions which have been made and their effects. After the implementation of the method, the movements of special particle configurations were investigated. The results have been compared with observations given in the literature and new experiments. Furthermore known results for some configurations have been extended, especially to take a closer look at the long time behaviour. In case of fibres, which were assumed to be rigid, a new approximation has been introduced. They were modelled as a rigid chain of spheres. Afterwards this modelling was proven to be fairly good by comparing the drag coefficients of simulation results of single and undisturbed fibres with an analytical approach for cylinders or experiments with single chains of spheres. Afterwards, this new modelling idea proved to have sufficient quality for dynamic simulations by comparing not only one single fibre, but also two settling fibres. After these...



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