

Filter Aid Characterization and Selection

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Abstract

Filter aids are applied to improve filtrate rate, filtrate quality, or cake density of difficult to filter materials, such as fine colloidal particles, flocculated, or gel like deformable, or compactible particles. Selection of a filter aid for a filtration process is normally based on specifications of the application, and characterizations of filter aids including bulk density, particle size (d10, d50, d90), permeability, filtrate quality, and cake density. The physical and filtration properties have served as basics for filter aid product evaluation, screening, and selection. However, the data sometimes are not instructive due to physical and surface chemical variations of filter aids particles in actual process systems, or complications of filtration process due to the existence of extra fine particles in the filter aid products. In this paper, other properties such as zeta potential(via streaming current measurement) in water, wt or volume% of less than 1 micron particles, pore size and pore structure characteristics are added to the filter aids characterization. Over 20 different type and grades of Rice Hull Ash, Diatomaceous Earth, and Perlite filter aids are investigated. Correlations of cake performance, cake structure and filter aid particle properties will be presented. A new approach to evaluate performance of a filter aid product is developed. With the new filter aid characterization approach, filtration performance of a filter aid product is quite predictable and consistent to results from filtration tests with actual system fluids.