Comparing the quality of solution of inverse problem in nephelometric and turbidimetric measurements

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Abstract

The paper presents results of the simulation research aiming at comparison of the quality of reconstruction of particle size distribution of dispersed phase in particulate systems by solving the inverse problem for nephelometric measurement data and for turbidimetric measurement data corrupted to a varying extent by random errors. In the case of both measurement techniques mathematical models based on Mie light scattering theory were applied. The results obtained demonstrated that the reconstruction on the basis of turbidimetric measurements is characterized by generally bigger accuracy compared to the reconstruction on the basis of nephelometric measurements. The advanatage of the reconstruction based on turbidimetric measurement data over the reconstruction based on nephelometric measurement data increases significantly in the case of measurement data of both kinds affected by random noise.

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