

Regularities of Solid-phase Continuous Vibration Extraction and Prospects for its Industrial Use

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The results of the substantiation and hardware design of continuous vibroextraction for solid-liquid systems with a small difference in the density of phases are presented, which provide the possibility of determining the rational constructive and technological parameters of vibroextractors and modes of their industrial exploitation. Mathematical modeling and methods of experimental evaluation of the mass transfer efficiency are based on the phenomena of non-stationary mass transfer and hydrodynamics. The mechanism of counter-phase separation of phases during the continuous process and features of mass transfer at all scale levels are described. Theoretical substantiation is given to convective mass transfer taking into account the accumulation component of the substance, which, taking into account the mass return in the zone of mixing, is what discloses the content of this component. The realization of the obtained results allowed to develop the engineering calculation method of vibroextraction in the food industry, high-efficiency energy-saving vibroextractors of continuous action and, based on them, apparatus-technological schemes of rational deep processing of plant raw material for a number of industries.

Keywords: Vibroextraction, Mathematical Model, Hydrodynamics, Mass transfer, Diffusion, Pulsating Flow.

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DOI: 10.1007/978-3-030-22365-6_92