

# **MICRO- AND MACRO-MIXING EFFECT IN THE CASE OF INTENSIFICATION AND SCALING-UP OF TRANSFER PROCESSES IN BIOREACTORS**

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Offered are the combined analytical dependences linking parameters of biosynthesis with characteristics of micro- and macro-mixing level in the case of intensification and scaling-up of biosynthesis processes.

Offered and evaluated in the pilot- and industrial-scale reactors are the dynamic methods for determining the micro- and macro-transfer parameters directly connected with the intensity of micro- and macro-mixing.

Carried out was an experimental check of the suggested analytical dependences in the case of scaling-up of bioreactors with vibro-mixing (after the authors' design) and routine stirred bioreactors.

Obtained were the design dependences which will be interest for optimization of structural and operating parameters of bioreactors due to the rational power distribution at the levels of mixing (micro-, macro-mixing) for given biosynthesis conditions.