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Dispersion paracetamol using the method of SAS

© **Ilnar Sh. Khabriev**,[1]*+ **Vener F. Khairutdinov**,[1] **Zufar I. Zaripov**,[1] **Farid M. Gumerov**,[1] **Vladimir A. Petrov**,[2] **Nina V. Kuznetsova**,[2] and **Rafail M. Huzahanov**[3]

[1] *Department Theoretical Basics of Heat;* [2] *Department of Chemistry and Technology of Macromolecular Compounds;* [3] *Department of Chemistry and Processing of Elastomers. Kazan National Research Technological University. Karl Marx St., 68. Kazan, 420015. Tatarstan Republic. Russia. Phone: +7 (843) 231-42-11. E-mail: termi0@yandex.ru*

*Supervising author; +Corresponding author

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Abstract

The use of supercritical fluids as a clean, efficient solvents is currently the fastest growing trend in the development of fundamentally new technologies in the major industrialized countries (USA, UK, Germany, Austria, France, Japan) and developing countries (Singapore South Korea and others.). In this process the dispersion was implemented paracetamol and its subsequent analysis using various techniques.

The analysis of phase equilibria in order to determine the optimal parameters of paracetamol dispersion by supercritical fluid anti-solvent (SAS). The results of experimental studies of the characteristics of phase equilibria for the systems: "atseton – supercritical carbon dioxide," "acetone – paracetamol," "acetone – paracetamol – supercritical carbon dioxide".

Isobaric heat capacity measurements were made of paracetamol in the temperature range 303-523 K, systems "supercritical carbon dioxide – paracetamol," "supercritical carbon dioxide – acetone – paracetamol" at 7-29 MPa and temperatures of 303-523 K on an automated pilot plant set up on the basis of scanning calorimeter *ITS-400*.

With all studies were conducted, the optimal parameters for dispersing paracetamol. Paracetamol was manufactured using the dispersion technique of supercritical fluid antisolvent at different thermodynamic parameters. The resulting dispersion of particles of paracetamol were analyzed by scanning electron microscopy (SEM) using AURIGA Cross Beam device with energy dispersive spectrometer INCA X-MAX. The obtained photographs are defined particle size and particle size distribution.

Differential scanning calorimetry, a comparative analysis of the physical properties of the source and the dispersed samples of paracetamol. Studies conducted on DSC823e apparatus from Mettler Toledo under dynamic conditions in the temperature range -50-300 °C at a heating rate of 10 °C/min in an air atmosphere. Examination of the crystal structure conducted on paracetamol automatic diffractometer with Ultima IV RIGAKU automatic theta-theta goniometer, K-β filter and the X-ray tube with a copper anode.

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