

**A NEW METHOD FOR RECRYSTALLIZING FLUFENAMIC ACID
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Preliminary studies conducted with representatives of several phenamates that contain an amino group, carboxyl, and aromatic fragments in their molecules, using quantum chemistry methods and in situ high-pressure IR spectroscopy, confirm the occurrence of a reaction with supercritical carbon dioxide. The presented work found that in a saturated solution of flufenamic acid in scCO₂ at a temperature of 140°C and a pressure of 500 bar, a chemical reaction occurs between these compounds. The reaction is facilitated by the attack of a carbon dioxide molecule on the carboxyl group of flufenamic acid. As a result, an amorphous reaction product is formed, which is thermally stable at least up to 140°C. Analysis of the product using ATR IR spectroscopy indicates the presence of a small amount of unreacted flufenamic acid in the reaction mixture, the dominant component of which is the reaction product. However, in the presence of crystallization centers, this compound decomposes under normal conditions within a relatively short period, depending on the morphology of these centers, releasing CO₂ and pure flufenamic acid in crystalline form. Through X-ray diffraction analysis of the crystalline phase obtained in this manner, it was established that during crystallization from the amorphous reaction mixture, a stable third polymorphic modification of flufenamic acid is formed, while the crystalline structure of the initial flufenamic acid is the first polymorph. Thus, a recrystallization method is proposed which, unlike standard physical recrystallization, is a chemically mediated process that allows for the production of a different polymorphic modification of the same substance.

The work was carried out with financial support from the Russian Science Foundation grant No. 22-13-00257-P.