

Method for conducting a heterogeneous process with granular material in a drum reactor with self-conveying internal loading rotating about a horizontal axis, which includes feeding the material and reagents into the drum chamber, carrying out the reaction process by diffusion of the reagents to the reaction zone at the phase boundary, activated adsorption of reagent particles on the surface, physicochemical transformations of the adsorbed particles, desorption of the formed reaction products, and diffusion of reagents and products through the bed of granular material, followed by removal of the reaction products from the chamber. In this process, the granular bed is subjected to pulsating motion with variable expansion across the cross-section of the chamber. The reaction process is carried out while the bed undergoes self-excited oscillations in a mild mode.