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Abstract

A high-energy planetary mill AGO-2 was used for mechanical activation of synthetic graphite with the particle size of 25-30 μm and specific surface area S_{BET} = 3.0 m^2/g in air for 1 – 60 min at a 100 g acceleration of milling bodies. The X-ray diffraction, Raman spectroscopy and electron microscopy studies showed that the 60 min mechanical activation of graphite decreases the number of graphene layers in graphite crystallites to 8–12 and induces their turbostratic disorder. The size of graphite particles decreases to 6.9 μm after 30 min of mechanical activation and increases to 12.1 μm when the time of mechanical activation is extended to 60 min. Similar changes are observed for the true density of graphite: after 60 min of mechanical activation it becomes equal to 2.48·103 kg/m^3, which is by 10 % higher than the true density of graphite not subjected to such treatment. The specific adsorption surface of graphite (S_{BET}) reaches its maximum values, 427-460 m^2/g, after 7-12 min of mechanical