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Original Research Paper

Controlled modification of sodium montmorillonite clay by a planetary ball-mill as a versatile tool to tune its properties

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Highlights

- Based on energy supplied, montmorillonite can be modified optimally.
- Montmorillonite's (00,1) plane disappears at 6.6J/g.
- The complete amorphization of montmorillonite occurs above 38J/g.
- The formation of agglomerates decreases the specific surface area.

Abstract

The effect of the energy supplied ($\mathbf{E}_{supp}$) by the planetary ball-mill on montmorillonite clay is studied. Sodium montmorillonite clay was subjected to different energies supplied, and the effects were followed by transmission electron microscopy, X-ray diffraction, infrared spectroscopy, thermogravimetric analysis, and specific surface area (BET). The results show that between 1.7J/g $\leqslant$