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Nanocrystalline graphite embedded in carbonized hydrochars: an alternative matrix material for microwave absorption

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Abstract

Carbonized hydrochars have been synthesized in this study, which could be matrix materials with low cost, simple fabrication process and high yield as the substitute of reduced graphene oxides (RGO) or carbon nanotubes (CNTs). The carbonized hydrochars in the coexistence of amorphous carbons and nanocrystalline graphite particles, exhibit excellent microwave absorption performance, and the minimum reflection loss value can reach up to -40.36 dB. Besides, we have confirmed the only one type of polarized center induced by atom dislocations from nanocrystalline graphite with poor crystallinity. The micro electric currents, induced by electrons migration in amorphous carbons regions, contribute to conduction loss, and result in strong microwave absorption.

Keyword:

Carbon materials; Nanocrystalline materials; Energy storage and conversion

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