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Contribution on Lithium intercalating carbon nanotubes produced by SHS-method for ion batteries

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Carbon nanotubes are prepared by the technic of self-propagating high-temperature synthesis for the first time. The components for this synthesis are carboniferous materials (soda, limestone, and Teflon) and reducers (magnesium, lithium, and sodium) with addition of a nickel and cobalt catalyst. The morphology of the nanotubes (straight multiwall nanotubes apparently free of a catalyst, bent nanotubes completely filled with a catalyst, and carbon Nano fibers) is similar to that of nanotubes grown by chemical methods (CVD, CCVD, MWPCVD). The nanotubes account for 6-13 wt % of the product synthesized. A Simple model for lithium intercalated (10, 10) nanotube is developed. The electronic, optic, structural properties, storage capacity; and estimation of the charge transfer in the loss function of the n-type doping Li-intercalated bundles of single-walled carbon nanotubes (SWCNTs) by the two-zone vapors method have been studied using HRTEM, HREELS and electron diffraction.

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