Nanocomposites and nanomaterials

HIGH-QUALITY MULTI-WALLED CARBON NANOTUBES SUNTHESIS FROM PRODUCTS OF NATURAL GAS AIR CONVERSION

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The technology of high-quality multi-walled carbon nanotubes (MWCNT) synthesis was developed and tested in laboratory scale. The method is based on chemical deposition of carbon from products of natural gas air conversion.

The following tasks were solved to implement the elaborated technology:

– modes of catalytic natural gas air conversion were selected;

– materials of a catalytic substrate on which MWCNT are grown researched and selected;

– temperature regimes for MWCNT obtaining from products of methane air conversion were researched and selected;

– the kinetics of the process of MWCNT producing was researched;

– the laboratory and pilot units for MWCNT synthesis were designed and constructed. They composes from the electrical furnace and the quarts reactor, systems of temperature control and gas sampling for analysis. Products of natural gas conversion are fed onto catalytic substrate.

– the resulting material was examined on a scanning electron microscope JSM-6700 F and on the transmission electron microscope.

The results showed a high purity of the material which does not require an additional processing.