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Obtaining of Electroconductive Composite Textile Based on Carbon Nanotubes and Glass-Cloth

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In our industrial era, science is firmly integrated with many areas of techniques, particularly in the textile industry, which has led to the creation of a new class of material: smart textiles. Electroconductive textiles found their wide application and are actively used in a life and technology. In this work presents results of production of electroconductive composite smart-textile based on glass-cloth and carbon nanotubes. For obtaining cobalt oxide nanoparticles on the surface of glass-cloth, efficient, cheap, and easy method solution combustion was used. The possibility of using the cobalt oxide nanoparticles as catalyst in the carbon nanotube growth process by CVD process was shown. For investigation the structure and morphology of the carbon nanotubes and glass-cloth-based catalyst with Co_3O_4 X-ray diffraction (XRD), transmission electron microscopy (TEM) and scanning electron microscopy (SEM) methods were used. Obtained carbon nanotubes have diameter 23-26 nm. Current-voltage characteristics show good electroconductive properties of composite materials - CNT on glass-cloth. Prototype of soldier model with a heated jacket based on electroconductive smart-textile was made. The heating efficiency of the flexible heating element at low temperature was tested. Before connecting to a power source, temperature of the jacket was 0 °C. After connecting to a power source, the temperature of the jacket has increased to 45 °C. Smart-textile based on glass-cloth showed good electroconductive properties and effective Joule heating by externally applied current. This type of conductive glass-cloth with CNT can be used for various functional applications.