Carbon Nanowalls on Porous Forms of SiO_2 and Al_2O_3

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Abstract. Synthesis of carbon nanostructures on porous skeletons of SiO_2 aerogel and Al_2O_3 is presented. Prior to synthesis, the substrates were impregnated by particles of iron in a ferrous solution. Synthesis of carbon nanotubes was performed by hot filament chemical vapour deposition using methane as a source of carbon. Carbon nanowall growth was achieved on both types of porous substrates. Carbon layers inside the cavities were obtained on porous Al_2O_3 with the pores 1000 times larger than those in the SiO_2 aerogel. The experiment verified the hypothesis that on impregnating a porous material with a catalyst the porous material prevents coalescing of the metal catalyst. This is why no nanobundles arise, but carbon structures, nanotubes and nanowalls are formed. The expected penetration of carbon nanotubes into the pores of the aerogel has not been confirmed. The prepared carbon nanostructures were analysed by scanning electron microscopy and Raman spectroscopy.