Nanocomposites and nanomaterials

Fractal structures in the plasma arc synthesis of carbon nanoparticles

L.G. Keush, A.G. Starovoyt

National Metallurgical academy of Ukraine. Prospect Gagarina, 4, Dnipropetrovsk-49600, Ukraine.
E-mail:lina.keush@yandex.ua

Condensed matter can exist not only in the form of a dense continuous medium, but as much loosened porous structures [1], called fractal structures. These structures were obtained in the synthesis of plasma arc discharge [2] carbon nanoparticles. Formation of cathode deposit which contained fractal structure occurs in an atmosphere of inert gas (argon) under the pressure in 69 kPa during evaporation of anode and subsequent condensation of vapor substances cooling of inert gas, which extinguishes the kinetic energy of the atoms. Diffusing and colliding these atoms joined and form a fractal structures with a diameter of 0,6-40 μm, which is shown in Fig.

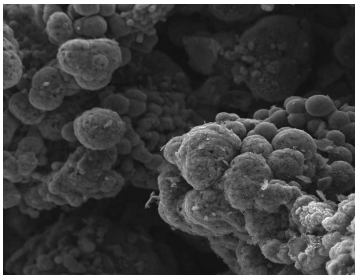

Fig. - Clusters of fractal structures

Thus, the conducted researches show that in the plasma arc synthesis along with carbon nanoparticles formed clusters of fractal structures.

1. *Золотухин И.В.* Фракталы в физике твердого тела // Соросовский образовательный журнал. – 1998. – N 7. – С. 108-113.
2. *Kundrapu M., Li j., Shashurin A., Keidar M*. A model of carbon nanotubes

synthesis in arc discharge plasmas // J. Phys. D.: Appl. Phys. – 2012. – **45**. – P. 305-315.