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NEW ARCHITECHTURE FORMATION OF BORON AND BORON-METAL POWDERED MIXTURES UNDER EFFECT OF CONCENTRATED LIGHT

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High-flux optical furnace presents a one of cleanest energy sources available for the Nanotechnology. Concentrated light heating of an optical furnace has number of advantages such as high heating and cooling rates, versatility and ability to adjust temperature profile along each axis, maximum operating temperatures and environmental adaptability. Moreover, this technique is appropriate for both conducting and non-conducting materials. Transformation of boron nitride and boron powders and mixture of 25 wt. % in Al, Cu, Fe, Ni in flow of nitrogen was considered. The effect of temperature distribution and temperature gradients within an experimental camera on architecture, phase composition and other properties of obtained powdered materials was demonstrated. The presence of catalyst promotes formation of nanostructures. Formation of new architecture of nanostructures can be explained in framework of "gaseous model" which was based on an evolution of the bubble during heating in an optical furnace. Burst of these bubbles results in graphene-like structures formation. The stepwise transformation of bubbles of appropriate chemical composition leads to nanotubes formation because of their pulling by heated gases upwards. Fullerene-like particles can also have complicated "fish-eye" ("core shell") structure in the result of segregation of transparent BN shell with H3BO3 layer on the surface around crystalline InN. Nano powder was prepared in an optical furnace under concentrated light heating has complicated gradient or layered structure. According Raman, AES and FTIR study the surface of all powders is composed of BN. XRD disclosed pure amorphous boron inside particle. Gradient transformation of pure boron to BN in the framework of one particle as well as layered nanostructure was observed by TEM study.

Biography

Lina L Sartinska has completed her PhD from Frantsevich Institute for Problems of Materials Science, National Academy of Sciences of Ukraine and Postdoctoral Studies from the same Institute. She is a Senior Researcher of Frantsevich Institute for Problems of Materials Science, NASU and has published more than 60 papers in reputed journals. She won Young Investigator Award, Institute for Problems of Materials Science, NASU, Japan Science Foundation Scholarship (Toyohashi University of Technology. Toyohashi, Japan), NATO Scholarship (New University of Lisbon, Portugal), Royal Society Scholarship, (Institute for Materials Research, University of Leeds, UK).She is Member of Organizing Committee of 4 and 6th International Conference "Nanotechnology", Tbilisi, Georgia. She has participated in a joint USA-Ukrainian CRDF project, joint Belarus-Ukrainian project and project of Science and Technology Center of Ukraine. She was a Manager of a joint Turkey-Ukrainian project and joint project supported by DLR (Germany) and MON (Ukraine).

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