



National Institute for Materials Science,

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Letter of support

Jan. 29, 2018

To the Special Scientific Council Д 26.207.03

This letter concerns support the nomination of *the habilitation thesis for Doctor of Science Degree in Specialty 05.02.01, 'Materials Science' on the Special Scientific Council Д 26.207.03 in Institute for Problems in Materials Science, NAS of Ukraine, Kyiv.*

Title of DSc habilitation thesis: “Features of consolidation, formation of the structure and properties of ceramic materials in the processes of spark-plasma sintering”, by: Borodianska Hanna Yu.

I met Dr. Borodianska about 18 years ago in Japan, and she impressed me with her research work at that time. Hence my continued conversation and subsequent collaboration with her. Her work is thorough, impactful, well justified and presented all the time. Her expertise in the field has led her to initiate interesting, original and novel solutions for problems. For almost 10 years Dr. Borodianska is studying consolidation and characterization of different materials and systems from oxides to borides, nitrides, carbides and their composites. Among the most recognizable of her works are those on spark plasma sintering of different nanostructured materials which now been organized as a habilitation DSc thesis “Features of consolidation, formation of the structure and properties of ceramic materials in the processes of spark-plasma sintering” and officially submitted to Special Scientific Council Д 26.207.03.

I would like to emphasize the excellent contribution to oxide nanoceramics. Dr. Borodianska proposed different interesting ideas and solutions targeting different consolidation aspects for these materials. Another area where she is known for her research leadership is in the field of calcination/homogenization of multicomponent powders during Spark Plasma Sintering. Progress has been done on single-steep synthesis & consolidation of multi-cation oxide nanoceramics.

In the last few years, Dr. Borodianska's publications mainly focused on borides and carbides in relation to new systems, its design and new applications. This bodes well with the international research community and I am sure in Ukraine. These her works, well presented in her habilitation DSc thesis and give not only a technological new perspective, but also a physical-chemical

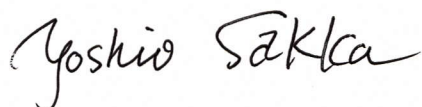
understanding of the involved processes and properties. Recently she explored reactive spark plasma sintering (R-SPS) of bulk boron-carbide based nano-composites.

Apart from this process, she is also showing the competence in “flash” and “flash-SPS” techniques, as far as a full range of synthesis and characterization techniques. This requires a very deep knowledge and large understanding of the field, original breakthrough approaches, planning skills and dedication. This allows Hanna myriad options when approaching a nanomaterials design problem.

The scientific impact and overall quality of her 37 ICI publications is beyond doubt. Dr. Hanna Borodianska and her collaborators published main results of her work in top journals like the J. Am. Ceram.Soc., J. Euro. Ceram. Soc., Scripta Mater., J. Ceram. Soc. Japan., J. Nanosci. Nanotech., Ceramics International.

I am sure that Dr. H. Borodianska's habilitation DSc thesis “Features of consolidation, formation of the structure and properties of ceramic materials in the processes of spark-plasma sintering” and her published ICI scientific papers have made a great contribution to the fundamentals of the spark plasma sintering of nanostructured ceramics and composites and deserve to be awarded with the scientific degree *Doctor of Science Degree in Specialty 05.02.01, 'Materials Science'*

Yours sincerely,



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