

# Present Status of SiC Component R & D for “DeeMe” Rotating Target

C. Kanda<sup>1#</sup>, J. S. Park<sup>1</sup>, H. Kishimoto<sup>1</sup>, S. Makimura<sup>2</sup>, M. Aoki<sup>3</sup> and A. Kohyama<sup>1</sup>

<sup>1</sup>*OASIS, Muroran Institute of Technology, Muroran, Hokkaido 050-8585, Japan*

<sup>2</sup>*J-PARC Center, KEK, Tokai, Ibaraki 319-1195, Japan*

<sup>3</sup>*Osaka University, Toyonaka, Osaka 560-0043, Japan*

# a corresponding author: E-mail [kanda.c@oasis.muroran-it.ac.jp](mailto:kanda.c@oasis.muroran-it.ac.jp)

“DeeMe” project is aiming at an experimental verification of the direct conversion of muon to electron by high energy proton bombardment, where rotating target for producing muon is the key element. In the project SiC target is the prime candidate and many trials have been made. However, many technological issues still remain, mainly from intrinsic brittleness of monolithic SiC and insufficient defect control by conventional fabrication methods like PIP (Polymer Infiltration and Pyrolysis) and RS (Reaction Sintering).

In OASIS (Organization of Advanced Sustainability Initiative for Energy System/Material), Muroran Institute of Technology, intensive R & D of high performance SiC and SiC/SiC has been carried out with emphasis on NITE (Nano-powder Infiltration and Transient Eutectoid) method. In addition to NITE method, an innovative concept called NIC (Nano-Infiltration and In-situ Carbonization) method has been initiated for this work.

The NIC concept is a combination/optimization of NITE and RS methods. In Fig. 1, brief introduction of NIC process is shown. Preform made with Si and C nano-powders is made into SiC under heating and pressurization. The formation of SiC is also shown as XRD results. Starting with the preliminary results of NIC method, the current status of component fabrication based on the “DeeMe” design will be provided. Basic properties and structural information of NITE and NIC materials will be presented and future R & D direction will be discussed.

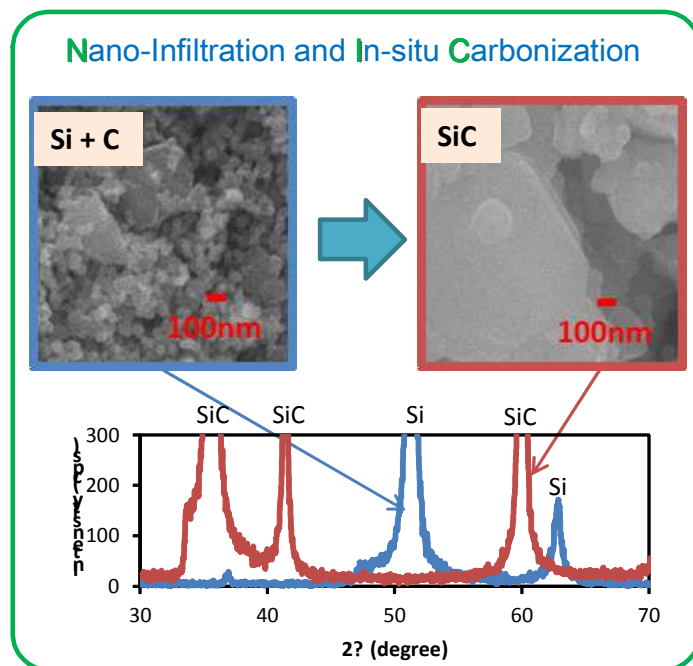


Fig. 1: SiC+C Preform to SiC by NIC Process