



IAEA FEC 2016

Contribution ID: 311

Type: Poster

INVESTIGATION OF W/CU FUNCTIONALLY GRADED MATERIAL WITH CMA PARTICLES AS PLASMA FACING FOR FIRST WALL COMPONENTS

Thursday, 20 October 2016 08:30 (4 hours)

10-layered (100 wt.% W- 90 wt. %W/10 wt. %Cu- 80wt. %W/2wt.%Cu...100wt.%Cu) W/Cu functionally graded material (FGM) with dispersion of Al₁₃Fe₄ CMA particles was synthesized by powder metallurgy technique at different temperatures for 1 hour under a load of 650 MPa. The influences of different sintering processes on relative density, hardness, neutron irradiation resistance and microstructure at various layers of sintered samples were investigated. The experimental results indicated that the graded structure of the composite by addition of CMA nano particles could be well densified after the hot press process. The relative density increased with the increment of sintering temperature and it was up to 96.53% as sintered at 850 °C. In addition, the coefficient of friction reached 0.1 at room temperature and 0.14 at 400 °C, which could be ascribed to the specific heat resistant and heat sink properties of the CMA and Cu content respectively enwrapped by net-like Cu. And the Vickers hardness was converted from 5.2 to 5.68 GPa with in the different zones of the bulk graded material.

Paper Number

MPT/P5-17

Country or International Organization

Iran

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Session Classification: Poster 5

Track Classification: MPT - Materials Physics and Technology