

Influence of Process Parameters on Refining Efficiency and Microstructure of Electron Beam Treated Hafnium Sponge

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Abstract. Possibilities of impurity removal from Hf sponge (97.931%) at single electron beam melting under different process modes are studied. Conditions for achieving the highest refining effectiveness are evaluated on the basis of the calculated values of vapor pressure of hafnium, the controlled metal impurities and their oxides, relative volatility for the metal impurities in hafnium material and free energy for possible chemical interactions. It is shown that prolonged refining at a higher temperature contributes to the obtaining of a more uniform fine-grained structure with evenly distributed impurities.