

Investigation on low activated materials on the base of V-Ti-Cr alloys

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Low activated materials on the base of vanadium are among the key materials for future fusion reactors. In the Russian Federation the long term National Program on the development of such vanadium alloys is under the way.

The information on the industrial production of high purity metallic vanadium has been presented. The data on the pilot batches of industrially produced ingots of V-(4-5)%Ti-(4-5)%Cr alloy with low impurities level and with diameter 137 mm and weight 50 kg is given.

The chemical and microstructural investigation of these ingots has been carried out and the results are presented and analyzed. It was shown that uniform distribution of main doping elements all over the ingots body has been successfully attained.

The transformation of microstructure from casted state in ingots to the deformed one in sheet half products depending on the regimes of deformation and intermediate heat treatments is analyzed and described. It is shown that uniform equiaxed microstructure could be attained in sheets of V-(4-5)%Ti-(4-5)%Cr alloy.

It is shown that the level of low impurities content attained in the ingots melted in Bochvar Institute (Moscow) corresponds to the level of impurities (O, N, C) attained in the ingots of analogues V-Ti-Cr alloys produced in the USA (832665; 832864) and in the Japan (NIFS-1; NIFS-2).

The calculations of the rate of diminishing of the accumulated radiation activity for the alloy V-4%Ti-4%Cr is presented.