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# Overview of the vanadium alloy researches for fusion reactors

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ABSTRACT

Various vanadium alloys are being developed as one of the options of structural materials for advanced blankets of fusion reactors. Besides the large heats made in Japan and US, a 110 kg V–4Cr–4Ti ingot was produced in RF recently. Development of advanced vanadium alloys were also carried out, such as the ultra-fine grain alloys containing Y and that with W and TiC strengthening particles. Investigations were performed for further widening of temperature and mechanical application windows of the reference V–4Cr–4Ti alloy by plastic deformation and heat treatments. Neutron irradiation effects combined with lithium corrosion were studied. In addition, some efforts are oriented to issues related to DEMO blanket manufacturing technology, such as W coating for first wall protection and the welding technologies to fabricate large vanadium component. This paper highlights the recent activities of these vanadium alloy researches, discusses the critical issues and summarizes the remaining issues to be addressed.

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