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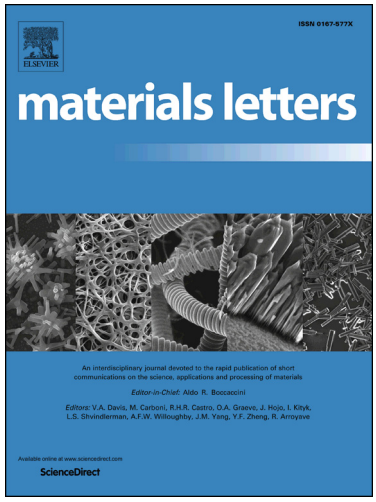

High pressure torsion-induced amorphous phase in a multilayer V-10Ti-5Cr / Zr-2.5Nb / V-10Ti-5Cr hybrid material

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High pressure torsion-induced amorphous phase in a multilayer V-10Ti-5Cr / Zr-2.5Nb / V-10Ti-5Cr hybrid material

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Abstract. A layered metallic hybrid material based on vanadium and zirconium alloys was obtained by high pressure torsion (HPT) at room temperature. HPT of the initial three-layer V-10Ti-5Cr alloy / Zr-2.5Nb alloy / V-10Ti-5Cr alloy billet resulted in a "mixing" of the zirconium alloy layer with vanadium alloy layers. A mixed nanostructure consisting of elongated grains (fragments) with a width of 40-50 nm was formed in the zirconium / vanadium alloy layers of the hybrid. Partial amorphization in the zirconium alloy layer of the hybrid material was found.

Keywords: Hybrid materials; Multilayer structure; Metals and alloys; High pressure torsion; Interfaces; Amorphous materials

1 Introduction

The high pressure torsion (HPT) method makes it possible to achieve very high degrees of shear strain in metallic materials under high pressure conditions (1-20 GPa