

Abstract Submitted
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New superconductor of the M_2AX family with Ti_2GeC composition. A.D. BORTOLOZO, O.H. SANT'ANNA, C.A.M. DOS SANTOS, A.J.S. MACHADO, Departamento de Engenharia de Materiais EEL USP - Lorena Brazil. Polo Urbo Industrial Gleba AI-6 P.O. BOX 116 12600-970. — In this work the Ti_2GeC phase is investigated by x-ray diffraction, magnetic and resistivity measurements. Polycrystalline samples with nominal compositions Ti_2GeC were prepared by solid state reaction. The samples were encapsulated under argon and heat-treated at $1100^\circ C$ for 240 hours. X-ray powder diffractograms suggest that all peaks can be indexed with the hexagonal phase of Cr_2AlC prototype. The electrical resistance as a function of temperature for the Ti_2GeC reveals a standard metal like behavior when this material is cooled from the heat treatment under equilibrium conditions. However, magnetic measurements display diamagnetic behavior close to 9.5K. On the other hand, when the Ti_2GeC phase is submitted a rapid quenching the $R(T,B)$ curve shows superconducting critical temperature close to 9.5K without applied magnetic field. The magnetoresistance data with applied magnetic field suggests bulk superconductivity. In spite of the great number of compounds which belong to this family, superconductivity has been reported for five cases. So, this work sustains the idea of the existence of a new class of superconducting materials that crystallizes in the Cr_2AlC prototype.

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