

Abstract Submitted  
for the MAR12 Meeting of  
The American Physical Society

**Superconductivity in the  $T_2$  phase of the Ta-Ge-B system** LUCAS EDUARDO CORRÊA, CARLOS NUNES, GILBERTO COELHO, ANTONIO AUGUSTO SILVA, ZACK FISK, ANTONIO JEFFERSON MACHADO, None, UNIVERSITY OF CALIFORNIA AT IRVINE COLLABORATION — In the Ta-Ge system the  $\alpha\text{Ta}_5\text{Ge}_3$  phase is not superconductor. Considering the high solubility of this phase for boron, in this work it has been evaluated the effect of boron doping in  $\alpha\text{Ta}_5\text{Ge}_3$  on the electrical, heat capacity and magnetic properties of the produced materials. It has been shown that boron doping promoted superconductivity for some specific composition. The  $\text{Ta}_5\text{GeB}_2$ , also named  $T_2$  phase, crystallizes in the tetragonal symmetry with  $\text{Cr}_5\text{B}_3$  prototype structure. In this composition the sample presented the maximum superconducting critical temperature (3.4 K). Others systems that exhibit the existence of the  $T_2$  phase present superconductivity such as  $\text{Mo}_5\text{SiB}_2$  ( $T_c \sim 5.5$  K),  $\text{Nb}_5\text{Si}_{3-x}\text{B}_x$  ( $T_{cmax} \sim 7.8$  K) and  $\text{W}_5\text{SiB}_2$  ( $T_c \sim 5.5$  K). Thus,  $\text{Ta}_5\text{GeB}_2$  is more one example.

Lucas Eduardo Corrêa  
None

Date submitted: 16 Nov 2011

Electronic form version 1.4