

Growing and characterization of zintl compound $\text{Yb}_{11}\text{AlSb}_9$

Friday 2 December 2016 11:45 (15 minutes)

The growing interest in new materials with promising electronic properties, such as thermoelectricity and superconductivity, among others, has awakened the interest scientific community. A family of compounds known as Zintl compounds, has been extensively studied. The Zintl compounds are governed by the charge equilibrium between donor ions and complex structures, and generally present cells of large units. One family of complex Zintl phase that has been recently investigated is comprised of $\text{RE}_{11}\text{MPn}_9$ and $\text{AE}_{11}\text{MPn}_9$ compounds (RE = Yb, Eu; AE = Ca, Sr; M = Transition metal; Pn = Pnictogens). Single crystals have been grown by the flux method using Sn flux. $\text{Yb}_{11}\text{AlSb}_9$ crystallized in an orthorhombic structure (space group Iba_2) with lattice parameters $a = 11.76 \text{ \AA}$, $b = 12.39 \text{ \AA}$ and $c = 16.68 \text{ \AA}$. The $\text{Yb}_{11}\text{AlSb}_9$ electrical resistivity shows metallic behavior at room temperature, and at low temperature there is an increase indicative of a small gap semiconducting ground state and present H-dependence below $T = 2 \text{ K}$. Specific heat data show us the significant sample and H-dependence as observed in resistivity measurements. We also observed a dependence with the magnetic field of C_p to $T < 4 \text{ K}$ at $T = 0.4 \text{ K}$. The electronic contribution was extracted from the linear fit of the curve C_p/T depending on T to $T < 2 \text{ K}$ and showed a dependence on the Sommerfeld parameter with the temperature and the magnetic field, (T, H) , with values 230 mJ/mol.K^2 and $\approx 0 \text{ mJ/mol.K}^2$ for $H = 0$ and 3 T , respectively. This work is supported by UFABC, CNPq and FAPESP.

Tipo de Apresentação

Oral

Author: MAGNAVITA OLIVEIRA, Elio Thizay (UNIFAL-MG)

Presenter: MAGNAVITA OLIVEIRA, Elio Thizay (UNIFAL-MG)

Session Classification: Comunicações Orais I