

THERMOELECTRIC PROPERTIES OF TERNARY COMPOUNDS FROM THE Ce-Fe-Si SYSTEM.

D. Berthebaud¹, A.P. Pikul², O. Tougait¹, H. Noël¹ and D. Kaczorowski²

1- SCR/CSM, Université de Rennes 1, UMR CNRS 6226, Avenue de Général Leclerc, 35042
Rennes, France

2- Institute of Low Temperature and Structure Research, Polish Academy of Sciences,
P. O. Box 1410, 50-950 Wrocław 2, Poland

Polycrystalline samples of selected compounds from the ternary Ce-Fe-Si system, namely CeFeSi, CeFeSi₂, CeFe₂Si₂, Ce₅Fe₂Si₈, CeFe₉Si₄ and CeFe_{10.5}Si_{2.5}, were studied by means of electrical resistivity and thermoelectric power measurements carried out in a wide temperature range. All these materials were established to exhibit metallic conductivity, yet adequate description of $\rho(T)$ in terms of the Bloch-Grüneisen-Mott formula was possible only for CeFeSi and CeFe₂Si₂. The largest Seebeck coefficient of about 40 $\mu\text{V/K}$ above 100 K was found for strongly intermediate valent compound CeFeSi. The magnetic properties of the new phase CeFe₉Si₄ were determined for the first time. The compound is a soft ferromagnet due to iron contribution, with the Curie temperature of about 70 K and the saturation magnetic moment of only 0.5 μ_{B} per Fe atom.

E-mail Presenting Author : tougait@univ-rennes1.fr