J. Mountain Res., Vol- 5 pp.37 - 41, December, 2010, ISSN. 0974 – 3030

LATTICE SPECIFIC HEAT AND LOCAL DENSITY OF STATES OF GOLD BASED DILUTE ALLOYS AT VERY LOW TEMPERATURES.

VANDANA GAIROLA AND P D SEMALTY
semalty@rediffmail.com
Department of Physics H N.b Garhwal University Campus, Badshahithaul,
Tehri-Garhwal–249199, India

Received: 10-10-2010 **Revised: 21-11-2010** **Accepted: 9-12-2010**

ABSTRACT

A theoretical study of the low temperature lattice specific heat of Au0.9807V0.0193 and Au0.99Ni0.01 dilute alloys taking into account the effect of volume change along with the effect due to mass and force constant change has been carried out. Lattice Green's function method has been used to calculate the local density of states of substitutional impurity and change in lattice specific heat in these alloys. The condition of resonance and localized modes has also been investigated for possible occurrence of these modes. The calculated results of change in specific heat are compared with the experimental measurements and a good agreement between theory and experiment has been obtained. Although, the calculated results did not show any resonance modes, the localized modes above the maximum frequency have been obtained. The change in lattice specific heat as a result of introduction of small fraction of impurities is explained on the basis of obtained localized modes.

Keywords:

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