DEVIATIONS FROM THE MATTHIESSEN'S RULE IN MAGNETIC DISORDERED ALLOYS: THEORETICAL INVESTIGATIONS

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9.7 cm

The model of the magnetic disordered alloys, including the itinerant electrons, localized spins and phonons, was elaborated in details in the paramagnetic region with the use of the Coherent Potential Approximatiom (CPA) approach. The expression for the DC electrical conductivity was taken from the Kubo-Greenwood formula for the alloys. The separate (residual, phonon and magnetic) contributions to the resistivity for the temperatures above Curie transition temperature for different sets of the model parameters were calculated. The linear temperature dependence of the phonon contribution to the resistivity was reproduced except from the anomalous behaviour observed for the parameters sets for which the Fermi level locates near the bands edges. For the same parameters sets our calculations showed the largest deviations from the Matthiessen's rule. Our model calculations confirmed the Matthiessen's rule generalized to the case of the three, residual, phonon and magnetic contributions to the resistivity of the magnetic disordered alloys with the partially filled band when the Fermi level locates far from the bands edges.

13.4 cm

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