

The Electrical conductivity of Fe-Ni-Co alloy

Assistant Lecturer *Mareim A. AL-Jubori , Rasha S. AL-Lami ,*
Assistant Lecturer *Nuha H.AL-Hasan*

University of Basrah - College of Engineering –
Dept. of Material Engineering

Abstract

The theory of electrical conductivity can be apply with Fe-Ni alloy has content the iron about 57.84, nickel 42.6 and it's clear to presence of cobalt 0.16 in the alloy by surface analysis for the dimension of sheet (25×25) cm.

The electrical conductivity of Fe-Ni alloy was calculated from first principles after the experimental the current density as a function of a potential gradient was modeled by calculating the conductivity based on reasonable values of the potential – current by using the length and the cross- sectional area of the sheet for the Fe-Ni alloy. The surface analysis of this sample appears a small concentration of cobalt affect the electrical conductivity of this alloy.

The experimental conductivity according for a small sheet is value $1.8 \times 10^3 (\Omega.cm)^{-1}$ it's appears less than the transition metals.

Electrical conductivity σ is used to specify the electrical character of a material. It is simply the reciprocal of the resistivity. Then the resistivity of this alloy is approximant $(0.55 \times 10^{-5} \Omega.m)$. this value of resistivity increase little from 4750 alloy is content of Fe -48% Ni.