

Studi sifat kelistrikan dan kemagnetan serta efek magnetoresistan material $\text{La}_{0,67}\text{Sr}_{0,33}\text{Mn}_{1-x}\text{Ni}_x\text{O}_3$ yang disintesis dengan metode sol gel = Study of electrical properties magnetic properties and magnetoresistance effect of $\text{La}_{0,67}\text{Sr}_{0,33}\text{Mn}_{1-x}\text{Ni}_x\text{O}_3$ material synthesized by sol gel method / Utami Widyaiswari

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Abstrak

Telah dilakukan penelitian sifat listrik, sifat magnet, dan efek magnetoresistan bahan perovskite manganites $\text{La}_{0,67}\text{Sr}_{0,33}\text{Mn}_{1-x}\text{Ni}_x\text{O}_3$. Sampel dibuat dengan metode sol gel. Hasil karakterisasi XRD menunjukkan bahwa sampel sudah memiliki fase tunggal dengan struktur rhombohedral dan space group R-3c. Pemberian doping Ni tidak mengubah struktur kristal namun menurunkan nilai parameter kisi kristal. Karakterisasi SEM-EDX menunjukkan bahwa unsur Ni sudah masuk ke dalam sampel dan adanya perubahan morfologi sampel ketika doping Ni divariasikan.

Data resistivitas sebagai fungsi temperatur menunjukkan bahwa doping Ni meningkatkan besar resistivitas bahan dan menggeser temperatur transisi metal-isolator ke temperatur yang lebih rendah. Efek magnetoresistan yang diberikan menunjukkan adanya peningkatan persen magnetoresistan saat doping Ni dinaikkan. Sedangkan kurva histerisis yang dihasilkan menunjukkan bahwa pemberian doping Ni menurunkan sifat kemagnetan bahan yang ditunjukkan oleh penurunan magnetisasi bahan.

The electrical properties, magnetic properties, and magnetoresistance effect of perovskite manganites $\text{La}_{0,67}\text{Sr}_{0,33}\text{Mn}_{1-x}\text{Ni}_x\text{O}_3$ material have been studied. Samples were synthesized by using sol gel method. The result of XRD characterization showed that samples were single phase with Rhombohedral structure and R-3c space group. Ni doped did not change crystal structure but decreased lattice parameter. SEM-EDX characterization showed that Ni was included in the samples as a doping and the morphology of samples changed with various Ni doped.

Resistivity as temperature function showed that Ni doped increased the resistivity and decreased the metal-insulator transition temperature. Magnetoresistance effect of samples relatively enhanced with increased of Ni doping. While the hysteresis curve from VSM characterization showed that Ni doped decreased magnetic properties of samples.