

Pengaruh doping Cu terhadap sifat kelistrikan dan efek magnetoresistansi dari $\text{La}_{0.7}\text{Ba}_{0.1}\text{Sr}_{0.2}\text{Mn}_{1-x}\text{Cu}_x\text{O}_3$ ($x = 0; 0,05; 0,1; \text{ dan } 0,15$) = Effect of Cu doping on electrical properties and magnetoresistance of $\text{La}_{0.7}\text{Ba}_{0.1}\text{Sr}_{0.2}\text{Mn}_{1-x}\text{Cu}_x\text{O}_3$ ($x = 0; 0,05; 0,1 \text{ and } 0,15$)

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Abstrak

Telah dilakukan penelitian mengenai pengaruh doping Cu terhadap sifat kelistrikan dan efek magnetoresistansi dari $\text{La}_{0.7}\text{Ba}_{0.1}\text{Sr}_{0.2}\text{Mn}_{1-x}\text{Cu}_x\text{O}_3$ $x= 0; 0.05; 0.1; \text{ dan } 0.15$. Hasil karakterisasi XRD menunjukkan bahwa $\text{La}_{0.7}\text{Ba}_{0.1}\text{Sr}_{0.2}\text{Mn}_{1-x}\text{Cu}_x\text{O}_3$ memiliki fasa tunggal dengan struktur kristal rhombohedral dengan space group R-3c. Karakterisasi dengan SEM-EDX menunjukkan terjadinya perubahan ukuran grain sampel ketika ada variasi doping Cu serta menunjukkan bahwa Cu berhasil disubstitusikan ke dalam sampel. Data resistivitas sebagai fungsi temperatur menunjukkan bahwa semakin besar doping Cu, nilai resistivitas semakin meningkat dan menggeser temperatur transisi metal-isolator ke temperatur yang lebih rendah. Nilai magnetoresistan yang dihasilkan semakin besar ketika doping Cu semakin besar.

The effect of Cu doping on electrical properties and magnetoresistance $\text{La}_{0.7}\text{Ba}_{0.1}\text{Sr}_{0.2}\text{Mn}_{1-x}\text{Cu}_x\text{O}_3$ $x = 0, 0.05, 0.1$ and 0.15 has been studied. The result of XRD characterization confirmed that $\text{La}_{0.7}\text{Ba}_{0.1}\text{Sr}_{0.2}\text{Mn}_{1-x}\text{Cu}_x\text{O}_3$ are single phased. The structures are rhombohedral with space group R 3c. SEM EDX characterization showed the variations of grain size and it showed that Cu ion has successfully substituted to the samples. The resistivity as a function of temperature showed that Cu doped increase the resistivity and decreased the metal insulator transition temperature. Magnetoresistance effect of samples relatively increased with increase of Cu doping.