

Pengaruh Substitusi Zn pada Senyawa $\text{La}_{0,8}\text{K}_{0,2}\text{MnO}_3$ di Site B terhadap Penyerapan Gelombang Mikro = Effect of Zn Substitution on Compounds $\text{La}_{0.8}\text{K}_{0.2}\text{MnO}_3$ at Site B on Microwave Absorption

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Abstrak

Material $\text{La}_{0,8}\text{K}_{0,2}\text{MnO}_3$ memiliki kemampuan penyerapan gelombang mikro yang cukup baik dan bandwidth yang lebar. Pada penelitian lain, beberapa material yang diberikan doping Zn di site B mampu meningkatkan kemampuan penyerapan gelombang mikro dan juga lebar bandwidthnya. Namun, belum ada penelitian doping Zn pada material $\text{La}_{0,8}\text{K}_{0,2}\text{MnO}_3$. Penelitian ini membahas pengaruh doping Zn pada material $\text{La}_{0,8}\text{K}_{0,2}\text{MnO}_3$ yang disintesis dengan variasi $x = 0,1; 0,3$ dan $0,5$. Material $\text{La}_{0,8}\text{K}_{0,2}\text{Mn}(1-x)\text{Zn}_x\text{O}_3$ disintesis menggunakan metode sol-gel, setelah sampel disintesis dilanjutkan dengan melakukan proses dehidrasi, kalsinasi, kompaksi dan sintering sebelum melakukan karakterisasi. Karakterisasi sampel menggunakan XRD, Permagraf dan VNA. Karakterisasi XRD menunjukkan bahwa material $\text{La}_{0,8}\text{K}_{0,2}\text{Mn}(1-x)\text{Zn}_x\text{O}_3$ memiliki fasa tunggal dengan struktur kristal rhombohedral. Pengujian menggunakan permagraf menunjukkan bahwa doping Zn meningkatkan nilai dielektrik dari material $\text{La}_{0,8}\text{K}_{0,2}\text{MnO}_3$. Hasil karakterisasi VNA menunjukkan doping Zn dapat meningkatkan kemampuan penyerapan gelombang mikro dari material $\text{La}_{0,8}\text{K}_{0,2}\text{MnO}_3$. Nilai reflection loss terbesar yaitu $-26,456$ dB pada frekuensi $9,644$ GHz untuk $x = 0,5$.

..... $\text{La}_{0.8}\text{K}_{0.2}\text{MnO}_3$ material has a fairly good microwave absorption capability and wide bandwidth. In another study, some of the materials provided by Zn doping at site B were able to increase the absorption ability of microwaves and also the width of the bandwidth. However, there have been no Zn doping studies on $\text{La}_{0.8}\text{K}_{0.2}\text{MnO}_3$ material. This study discussed the effect of Zn doping on $\text{La}_{0.8}\text{K}_{0.2}\text{MnO}_3$ material synthesized with variations $x = 0.1; 0.3$ and 0.5 . $\text{La}_{0.8}\text{K}_{0.2}\text{Mn}(1-x)\text{Zn}_x\text{O}_3$ material is synthesized using the sol-gel method, after the sample is synthesized it is continued by carrying out the process of dehydration, calcination, compaction and sintering before characterization. Sample characterization using XRD, Permagraph and VNA. XRD characterization shows that the material $\text{La}_{0.8}\text{K}_{0.2}\text{Mn}(1-x)\text{Zn}_x\text{O}_3$ has a single phase with a rhombohedral crystal structure. Tests using permagraphs showed that Zn doping increased the dielectric value of the $\text{La}_{0.8}\text{K}_{0.2}\text{MnO}_3$ material. The results of VNA characterization show that Zn doping can increase the microwave absorption ability of $\text{La}_{0.8}\text{K}_{0.2}\text{MnO}_3$ material. The largest reflection loss value is -26.456 dB at a frequency of 9.644 GHz for $x = 0.5$.