

ABSTRAK

Pada saat ini pemanfaatan serta pengolahan bahan alam oleh umat manusia sangat diperlukan untuk kelangsungan hidup dan menjaga agar terhindar dari krisis. Di era keterbukaan teknologi, informasi dan komunikasi pemanfaatan gelombang mikro telah banyak diimplementasikan hampir disegala bidang seperti komunikasi seluler, satelit, dan radar. Di asumsikan dari beberapa sisa-sisa hasil pertanian dapat dijadikan bahan baku absorber seperti sekam padi, ampas tebu, kulit pisang, sabuk kelapa, dan batok kelapa.

Prinsip kerja dari absorber adalah meminimalkan radiasi gelombang micro serta melemahkan energi gelombang arah datang pada absorber. Penelitian ini bertujuan untuk mencari alternatif lain bahan baku absorber dimana saat ini absorber berbahan dasar kimia banyak beredar dipasaran. Penelitian sebelumnya dengan batok kelapa dengan tingkat karbon aktifnya 25% dengan dimensi 200 mm x 200 mm dengan ketebalan 6,4 mm hasil yang didapatkan untuk reflection lossnya adalah -22dB pada frekuensi 9,6 GHz.

Proses desain absorber dan simulasi menggunakan software HFSS dengan relative permittivity (ϵ') 3.1781, relative permeability (μ') 1.2152, dan dielectric loss tangent (σ) 0.0719. Setelah absorber dibuat yakni dengan mencampur bubuk arang batok kelapa, resin serta katalis dengan beragam variasi dilanjutkan pengukuran menggunakan Vector Network Analyzer didapatkan rata-rata untuk reflection loss < -30 dB, faktor absorpsi < -20 dB dan persentase absorpsi adalah >99%.

Kata Kunci: *Absorber, Batok Kelapa, Biomaterial, Faktor Absorpsi, HFSS, Persentase Absorpsi, Reflection loss, Vector Network Analyzer.*

ABSTRACT

At this time the utilization and processing of natural materials by mankind is very necessary for survival and to keep it from crisis. In the era of technological openness, information and communication using microwaves has been widely implemented in almost all fields such as cellular communications, satellites, and radar. It is assumed that some agricultural residues can be used as absorber raw materials such as rice husks, bagasse, banana peels, coconut belts, and coconut shells.

The working principle of the absorber is to minimize microwave radiation and weaken the energy of the incoming wave at the absorber. This study aims to find other alternative absorber raw materials where currently chemical-based absorbers are widely circulating in the market. Previous research with coconut shells with 25% activated carbon level with dimensions of 200 mm x 200 mm with a thickness of 6.4 mm the results obtained for the reflection loss are -22dB at a frequency of 9.6 GHz.

Absorber design process and simulation using HFSS software with relative permittivity (ϵ') 3.1781, relative permeability (μ') 1.2152, and dielectric loss tangent (σ) 0.0719. After the absorber is made, it is done by mixing coconut shell charcoal powder, resin and catalyst with various The variation is continued by measuring using the Vector Network Analyzer, the average reflection loss is < -30 dB, the absorption factor is < -20 dB and the percentage of absorption is > 99%.

Keywords: *Absorber*, *Coconut Shell*, *Biomaterial*, *Absorption Factor*, *HFSS*, *Percentage of Absorption*, *Reflection loss*, *Vector Network Analyzer*.