Rice husk truncated pyramidal microwave absorber using quadruple P-spiral split ring resonator (QPS-SRR)

ABSTRACT

There are many types of agricultural waste being potentially used in the pyramidal microwave absorber, among which are rice husk, sugarcane baggase and others. This paper analyzes the use of rice husk as a truncated pyramidal microwave absorber with an integrated of split ring resonator structure. It also ascertains the effect of the Quadruple P-Spiral Split Ring Resonator (QPS-SRR) on the truncated pyramidal microwave absorber design. The QPS-SRR structure is located at the top part of the truncated pyramidal microwave absorber to improve the reflection loss value. This absorber is fabricated using agricultural waste of rice husk, polyester resin and hardener agent of Methyl Eethyl Ketone Peroxide (MEKP). The QPS-SRR truncated pyramidal microwave absorber is simulated using CST Microwave Studio simulation software. The study and simulation are performed in the frequency ranges between 10.50 GHz to 14.50 GHz. The addition of SRR has improved the pyramidal microwave absorber from - 34.81 dB to ï 51.171 dB in the range of 11.00 GHz to 11.25 GHz. Thus, it is recommended that the design of agricultural waste microwave absorber be integrated with the SRR structure which can lead in reducing the fabrication cost.

Keyword: Split ring resonator; Pyramidal microwave absorber; Rice husk; Reflection loss