

An analysis of the effect moisture has on the effective relative complex permittivity of ash particles created within fires has been presented within this paper. The inclusion of moisture within this hygroscopic material has a significant effect on the effective complex permittivity and, hence, its scattering ability. The investigations developed a mixing law model for describing moisture ingress in a 1000 °C burnt eucalypt ash sample. Using the measured trend found in the eucalypt samples, the effective complex permittivity with respect to the inclusion of moisture has been modeled with an empirical modification to the tri-phase unified mixing law.