

Natural materials as grounding filler for lightning protection system

ABSTRACT

Grounding resistance could significantly reduce with the usage of grounding filler for grounding rod in lightning protection system. However, the cost of the normally used grounding fillers such as bentonite and other chemicals is the main drawback. Therefore, it is an aim of this study to determine the electrical properties and durability of natural grounding fillers as an alternative to bentonite. The 61.8% rule from the fall of potential method was used to obtain values of grounding resistance of the lightning protection system installed with natural grounding fillers such as bentonite, coconut coir peat, planting-clay soil and paddy dust. The measured grounding resistances were then compared with the grounding resistance of the reference grounding rod. Results revealed that natural materials especially planting-clay soil is the best alternative to replace bentonite as grounding filler because it gave the lowest grounding resistance values at the end of the experiment and had generally the highest percentage reduction in grounding resistance.

Keyword: Natural material; Bentonite; Lightning protection; Grounding fillers; Grounding impedance