

ABSTRACT

ANALYSIS OF EFFECT OF ZEOLITE WITH COMBINATION OF BENTONIT AND GYPSUM TO THE VALUE OF RESISTANCE OF DRIVEN ROD SYSTEM

By

ANDHIKA WICAKSONO

The grounding system is a protection or protective system against over voltage surges to protect equipment connected to power sources and areas around the equipment. The purpose of grounding is to release lightning current or fault current into the earth in order to maintain the stability of the system and the security of electrical and building equipment. A good grounding system should have a low grounding resistance value ($<5\Omega$). In decreasing ground resistance should pay attention to several factors affecting the soil resistance are soil moisture, temperature, soil geological properties, and chemical composition in the soil. This study discusses the addition of additives to decrease ground resistance by adding zeolite additives combined with bentonite and gypsum. The composition of the additives mixtures are 50% zeolite + 50% bentonite, 50% zeolite + 50% gypsum and 50% bentonite + 50% gypsum. In this study, the electrode used is a single rod electrode. The purpose of this research is to analyze the effect of addition of additives, humidity and pH in reducing the value of ground resistance. The research results show that the resistance of grounding with additive is lower than that of grounding without additives. The addition of additives can reduce the value of grounding resistance up to 63% for zeolite + gypsum mixture, 45% for zeolite + bentonite and 60% for bentonite + gypsum. The highest moisture value of grounding is above 10% for the zeolite + bentonite . The highest acidity of mixture is 2.86 in mean value for the gypsum.

Keywords: grounding system, ground resistance, zeolite, bentonite, gypsum

ABSTRAK

ANALISIS PENGARUH ZEOLIT DENGAN KOMBINASI BENTONIT DAN GYPSUM TERHADAP NILAI TAHANAN PENTANAHAN SISTEM *DRIVEN ROD*

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Sistem pentanahan adalah sistem proteksi atau pengamanan terhadap lonjakan tegangan berlebih untuk melindungi peralatan-peralatan yang terhubung pada sumber listrik maupun daerah disekitar peralatan. Tujuan pentanahan adalah untuk melepaskan arus petir atau arus gangguan ke dalam bumi agar dapat menjaga kestabilan sistem dan keamanan peralatan listrik dan bangunan. Sistem pentanahan yang baik harus memiliki nilai tahanan pentanahan yang rendah ($< 5\Omega$). Dalam menurunkan tahanan pentanahan harus memperhatikan beberapa faktor yang mempengaruhi tahanan tanah yaitu kelembaban tanah, temperatur, sifat geologi tanah, dan komposisi zat kimia dalam tanah. Penelitian ini membahas tentang penambahan zat aditif untuk menurunkan tahanan pentanahan dengan menambahkan zat aditif zeolit terkombinasi bentonit dan gypsum. Komposisi dari campuran zat aditif yaitu sebesar zeolit 50% + bentonit 50%, zeolit 50% + gypsum 50% dan bentonit 50% + gypsum 50%. Dalam penelitian ini, elektroda yang digunakan adalah elektroda batang tunggal. Tujuan dari penelitian ini adalah menganalisis pengaruh penambahan zat aditif, kelembaban dan pH dalam menurunkan nilai tahanan pentanahan. Hasil penelitian menunjukkan bahwa tahanan pentanahan dengan zat aditif lebih rendah daripada tahanan pentanahan tanpa zat aditif. Penambahan aditif dapat menurunkan nilai tahanan pentanahan hingga 63% untuk campuran zeolit + gypsum, 45% untuk zeolit + bentonit dan 60% untuk bentonit + gypsum. Nilai kelembaban pentanahan tertinggi adalah di atas 10% untuk zeolit + bentonit. Keasaman tertinggi campuran adalah 2,86 dalam nilai rata-rata untuk gypsum.

Kata kunci: sistem pentanahan, tahanan pentanahan, zeolit, bentonit, gypsum

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