

ABSTRAK

ANALISIS TEGANGAN TEMBUS *CRUDE PALM OIL* DENGAN PENAMBAHAN BENTONIT DAN ZEOLIT TERAKTIVASI SEBAGAI ALTERNATIF ISOLATOR CAIR

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Intisari- Minyak isolasi merupakan salah satu jenis isolator yang banyak digunakan sebagai isolasi pada peralatan listrik seperti transformator. Minyak isolasi yang digunakan biasanya berasal dari minyak mineral dari dalam perut bumi yang terbatas ketersediaannya di alam. Salah satu upaya untuk mengurangi penggunaan minyak mineral adalah menggantikannya dengan minyak nabati seperti *crude palm oil* (CPO) yang telah ditambahkan dengan zat aditif bentonit dan zeolit. Untuk menguji kelayakan minyak *crude palm oil*, dilakukan pengujian tegangan tembus menggunakan *Megger OTS80Af Oil Tester*, kadar air dan viskositas. Berdasarkan hasil pengujian, tegangan tembus minyak CPO setelah ditambahkan bentonit sebesar 36,2 kV, kadar air sebesar 0,0157% dan viskositas sebesar 33,23 cSt. Sedangkan, tegangan tembus minyak CPO setelah ditambahkan zeolit sebesar 29 kV, kadar air sebesar 0,043% dan viskositas sebesar 33,56 cSt. Dari hasil tersebut dapat disimpulkan bahwa, minyak CPO dengan penambahan bentonit layak digunakan sebagai isolasi cair trafo, sedangkan minyak CPO dengan penambahan zeolit belum layak digunakan sebagai isolasi cair trafo, hal tersebut sesuai dengan standar SPLN 49-91 : 1982 tegangan tembus minyak untuk isolasi trafo adalah 30 kV/2,5 mm.

Kata kunci : CPO, Bentonit, Zeolit, Tegangan Tembus

ABSTRACT

ANALYSIS BREAKDOWN VOLTAGE OF CRUDE PALM OIL WITH ADDING ACTIVATED BENTONITE AND ZEOLITE AS AN ALTERNATIVE FLUID INSULATION

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Abstract- Crude palm oil (CPO) has been considered as a potential alternative to mineral oil as an insulating oil in electrical equipment such as transformers. The study conducted tests on the feasibility of using CPO by evaluating the breakdown voltage with Megger OTS80Af Oil Tester, moisture content, and viscosity of the oil after the addition of bentonite and zeolite additives. The breakdown voltage is an important parameter in assessing the suitability of an insulating oil. The breakdown voltage of CPO oil after the addition of bentonite was measured as 36.2 kV, which exceeds the specified standard of 30 kV/2.5 mm outlined in SPLN 49-91: 1982. This indicates that CPO oil with bentonite is suitable for use as liquid insulation in transformers. On the other hand, CPO oil with zeolite additive exhibited a breakdown voltage of 29 kV, which falls below the specified standard. Additionally, the moisture content and viscosity of the oils were measured. The moisture content of CPO oil with bentonite was found to be 0.0157%, while the moisture content of CPO oil with zeolite was 0.043%. The viscosity of both oils was measured as 33.23 cSt for bentonite and 33.56 cSt for zeolite. In summary, based on the breakdown voltage test and in accordance with SPLN 49-91: 1982, CPO oil with the addition of bentonite is considered suitable for use as liquid insulation in transformers. However, CPO oil with zeolite is not yet suitable for this purpose.

Keyword : CPO, Bentonite, Zeolite, Breakdown Voltage