

# Pengaruh penambahan antioksidan alami eugenol dan alpha-tocopherol terhadap stabilitas oksidasi biodiesel berbahan baku minyak jarak pagar = Effect of natural antioxidants addition of eugenol and alpha tocopherol on the oxidation stability of jatropha biodiesel

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## Abstrak

[<b>ABSTRAK</b><br>

Pemanfaatan bahan bakar biodiesel di Indonesia sudah menjadi prioritas dalam pengembangan energi baru dan terbarukan. Berbagai kendala yang dihadapi dalam produksi seperti bahan baku dan kualitas produk serta pemanfaatannya mendapat dukungan dari berbagai institusi untuk dapat diatasi bersama. Salah satu kendala pemanfaatan biodiesel adalah dimana bahan baku yang potensial untuk dikembangkan di Indonesia yang termasuk non-edible oil memiliki kualitas buruk untuk parameter stabilitas oksidasi. Tanaman jarak pagar merupakan salah satu contoh bahan baku yang potensial namun memiliki nilai stabilitas oksidasi yang di bawah standar SNI. Usaha untuk meningkatkan stabilitas oksidasi tanaman jarak sudah dilakukan antara lain dengan penambahan antioksidan. Antioksidan yang selama ini digunakan adalah antioksidan sintesis seperti BHA, BHT, TBHQ dan PG. Penelitian ini difokuskan pada pengembangan antioksidan alami yaitu eugenol dan &#945;-tocopherol untuk meningkatkan stabilitas oksidasi biodiesel dari tanaman jarak pagar. Hasil penelitian menunjukkan bahwa penambahan antioksidan eugenol dapat meningkatkan stabilitas oksidasi dari biodiesel minyak jarak. Untuk meningkatkan nilai stabilitas oksidasi biodiesel dari 5.3 jam hingga memenuhi SNI 7182-2012 yaitu 6 jam, diperlukan penambahan antioksidan eugenol minimal 1000 ppm. Penambahan antioksidan &#945;-tocopherol pada konsentrasi 500 ? 3000 ppm menurunkan nilai stabilitas oksidasi biodiesel.

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<b>ABSTRACT</b><br>

Utilization of biodiesel fuel in Indonesia has become a priority in the development of new and renewable energy. Various obstacles encountered in the production of such raw materials and product quality as well as its utilization has the support of various institutions to be addressed together. One obstacle is that the use of biodiesel feedstock potential to be developed in Indonesia, which includes nonedible oil has poor quality for oxidation stability parameter. Jatropha is one of potential raw material but has a value of oxidation stability under the ISO standard. Efforts to improve the oxidation stability of Jatropha has been done such as by the addition of antioxidants. Antioxidant that has been used is synthetic antioxidants such as BHA, BHT, TBHQ and PG. This study focused on the development of natural antioxidants eugenol and &#945;-tocopherol to improve the

oxidation stability of biodiesel from jatropha. The results showed that the addition of eugenol antioxidants can increase the oxidation stability of jatropha biodiesel. To increase the value of the oxidation stability of biodiesel from 5.3 hours to meet the SNI 7182-2012 which is 6 hours, required the addition of eugenol at least 1000 ppm. The addition of the antioxidant  $\alpha$ -tocopherol at a concentration of 500 - 3000 ppm decrease the value of the oxidation stability of biodiesel., Utilization of biodiesel fuel in Indonesia has become a priority in the development of new and renewable energy. Various obstacles encountered in the production of such raw materials and product quality as well as its utilization has the support of various institutions to be addressed together. One obstacle is that the use of biodiesel feedstock potential to be developed in Indonesia, which includes nonedible oil has poor quality for oxidation stability parameter. Jatropha is one of potential raw material but has a value of oxidation stability under the ISO standard. Efforts to improve the oxidation stability of Jatropha has been done such as by the addition of antioxidants. Antioxidant that has been used is synthetic antioxidants such as BHA, BHT, TBHQ and PG. This study focused on the development of natural antioxidants eugenol and  $\alpha$ -tocopherol to improve the oxidation stability of biodiesel from jatropha. The results showed that the addition of eugenol antioxidants can increase the oxidation stability of jatropha biodiesel. To increase the value of the oxidation stability of biodiesel from 5.3 hours to meet the SNI 7182-2012 which is 6 hours, required the addition of eugenol at least 1000 ppm. The addition of the antioxidant  $\alpha$ -tocopherol at a concentration of 500 - 3000 ppm decrease the value of the oxidation stability of biodiesel.]