

Analisis Pengaruh Biodiesel Storage terhadap Perubahan Karakteristik dan Pertumbuhan Deposit = Analysis of The Effect of Biodiesel Storage on Characteristic Change and Deposit Growth.

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Abstrak

ABSTRAK

Salah satu permasalahan utama yang terjadi dalam penggunaan biodiesel adalah stabilitas bahan bakar. Beberapa sifat fisik biodiesel umumnya berubah selama storage. Perubahan sifat fisika dan kimia sangat berkorelasi dengan stabilitas bahan bakar dan pembentukan deposit. Studi ini dilakukan untuk menganalisa pengaruh storage biodiesel B30 terhadap pembentukan deposit dan perubahan karakteristik biodiesel. Storage Condition dilakukan selama 3 bulan di dalam tangki berbahan stainless steel. Variasi Storage Condition adalah: (1) Relatif Humidity (RH) Tinggi, (2) RH sedang, (3) RH Rendah. Parameter kritis yang diamati adalah angka asam (TAN), viskositas kinematik, stabilitas oksidasi metode Rancimat, Density, FTIR, Kadar air, dan titik nyala yang diukur setiap 1 bulan. Selain itu untuk mengamati karakteristik dari pembentukan deposit bahan bakar biodiesel B30 pada setiap komponen di ruang bakar, dilakukan pengujian deposit dengan menggunakan Hot Chamber Deposition Test Rig dengan variasi suhu plat dan ruang chamber yang digunakan mendekati dengan kondisi engine aktual. Hasil yang diperoleh menunjukkan bahwa dalam periode 3 bulan terjadi peningkatan massa deposit bahan bakar dengan storage condition RH Tinggi, sedangkan pada storage condition RH Rendah dan RH sedang mengalami penurunan massa deposit. Hal tersebut disebabkan karena terjadinya oksidasi yang ditunjukkan dengan adanya pertumbuhan asam organik berdasarkan hasil uji FTIR. Sedangkan pada sampel dengan RH sedang dan RH rendah belum munculnya asam organik. Hasil TAN, Densitas, Viskositas, dan nilai kalor menunjukkan kecenderungan yang sama, yaitu terjadi kenaikan walaupun tidak terlalu besar. Stabilitas Oksidasi terjadi penurunan di bulan ketiga pada masing-masing storage condition sampel.

ABSTRACT

One of the main problems that occur in the use of biodiesel is fuel stability. Some physical properties of biodiesel generally change during storage. Changes in physical and chemical properties are highly correlated with fuel stability and deposit formation. This study was conducted to analyze the effect of B30 biodiesel storage on deposit formation and changes in biodiesel characteristics. Storage Condition is carried out for 3 months in a stainless steel tank. Storage Condition variations are: (1) High Relative Humidity (RH), (2) Medium RH, (3) Low RH. Critical parameters observed were acid number (TAN), kinematic viscosity, oxidation stability of the Rancimat method, Density, FTIR, moisture content, and flash point measured every 1 month. In addition to observing the characteristics of the formation of biodiesel B30 fuel deposits on each component in the combustion chamber, deposit tests were carried out using the Hot Chamber Deposition Test Rig with variations in plate temperature and chamber chamber used close to the actual engine conditions. The results obtained show that in a period of 3 months there was an increase in mass of fuel deposits with high RH storage conditions, whereas in storage conditions RH Low and RH were experiencing a decrease in mass deposit. This is due to the oxidation which is indicated by the growth of

organic acids based on the results of the FTIR test. Whereas in samples with moderate RH and low Rh organic acids have not yet emerged. The results of TAN, Density, Viscosity, and heating value showed the same tendency, namely an increase though not too large. Oxidation stability decreased in the third month of each sample storage condition.