Kajian stabilitas oksidasi campuran biodiesel minyak jelantah-solar dan kinerja mesin diesel = study of oxidaton stability of used frying oil biodiesel-petrodiesel blends and performance of diesel engine

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Abstrak

Penelitian ini mengkaji satu karakteristik biodiesel dan campuran biodiesel-solar yakni stabilitas oksidasi, bahan bakar dengan stabilitas oksidasi rendah dapat dengan mudah teroksidasi dengan udara, bila telah rancid atau tengik dapat mengakibatkan korosi dan kerusakan pada injektor, tangki dan elemen mesin lain. Metode 743 Rancimat (modified) round robin test khusus untuk menguji stabilitas oksidasi biodiesel, campuran biodiesel-solar dan solar melalui determinasi waktu induksi/induction time, hasilnya B100-UFO atau biodiesel minyak jelantah murni (Used Frying Oil/UFO) memiliki stabilitas oksidasi 1,6 jam (pada 110oC), B95-UFO 2,95 jam, B90-UFO 3,56 jam, B80-UFO 17,13 jam dan B30-UFO 98,24 jam. Dengan standar minimal stablilitas oksidasi 6 jam (EN 14112), Stabilitas oksidasi yang aman bagi mesin diesel dimulai B80 dan grafik trendline meperlihatkan B85 masih aman di kisaran 10 jam. Adapun kinerja mesin diperoleh hasil dibandingkan dengan solar, minyak jelantah sebagai campuran mengakibatkan kenaikan konsumsi bahan bakar untuk daya yang sama, mengakibatkan penurunan Brake Horse Power/BHP untuk semua campuran. Terdapat keunikan pada B15-UFO dibandingkan campuran biodiesel jelantah-solar yang lain yakni memiliki efisiensi thermal yang naik (0,26%) sedangkan campuran yang lain turun, pada kondisi putaran poros tetap memiliki kenaikan SFC yang paling rendah (2,34%) dan memiliki penurunan BHP yang paling rendah (9,38%).
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This research is studying oxidation stability of biodiesel and biodiesel-petrodiesel blends, fuel with low oxidative stability will be oxidized by atmosphere air easily, rancid fuel is corrosive and will damage the injector, tank and other elements. 743 Rancimat Method (modified) round robin test is only for determining the oxidative stability of biodiesel, biodiesel-petrodiesel and petrodiesel by determining induction time. The result : B100-UFO or the neat Used Frying Oil (UFO) Biodiesel has oxidation stability 1,6 hours (at 110oC), B95-UFO 2,95 hours, B90-UFO 3,56 hours, B80-UFO 17,13 hours and B30-UFO 98,24 hours. the minimum standard of oxidation stability is 6 hours (EN 14112), B80 is safe for diesel engine and graph trendline shows B85 is still safe as around 7 hours. The Diesel engine performance results are : w The Diesel engine performance results are : With petrodiesel as the standard, Used Frying Oil as blender make an increase of fuel consumption for the same power, make a decrease of Brake Horse Power/BHP for all blends. There are some uniqueness of the B15-UFO compared with other UFO biodiesel-petrodiesel such as it has an increase thermal efficiency (0,26%)as the other blends are decrease, at constant rotational speed (rpm) it has the lowest increase of SFC (2,34%) and the lowest decrease of BHP (9,38%). ith petrodiesel as the standard, Used Frying Oil as blender make an increase of fuel consumption for the same power, make a decrease of Brake Horse Power/BHP for all blends. There are some uniqueness of the B15-UFO compared with other UFO biodiesel-petrodiesel such as it has an increase thermal efficiency (0,26%)as the other blends are decrease, at constant rotational speed (rpm) it has the lowest increase of SFC (2,34%) and the lowest decrease of BHP (9,38%).;This research is studying oxidation stability of biodiesel and biodiesel-

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