Kajian pemanfaatan bioethanol dan aditif oksigenat pada mesin spark ignition dari tinjauan kinerja, emisi, dan coefficient of variation.= Study on the use of bioethanol and oxygenated additives in spark ignition engines from performance, emissions, and coefficient of variation overview.

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Abstrak

Saat ini ketergantungan masyarakat Indonesia terhadap bahan bakar fosil sangat tinggi dan nilainya selalu meningkat setiap waktunya. Padahal kebutuhan tersebut tidak mampu dipenuhi oleh kapasitas kilang pengolah minyak bumi yang saat ini ada di Indonesia. Akibatnya pemerintah Indonesia harus melakukan impor bahan baku dan produk bahan bakar. Selain itu beberapa pihak telah memprediksi bahwa jumlah cadangan minyak bumi global semakin mendekati masa akhir. Adapun dampak buruk penggunaan bahan bakar fosil terhadap lingkungan semakin memicu manusia untuk berupaya mencari alternatif dari bahan bakar fosil. Bioethanol (C2H5OH) merupakan salah satu potensi bahan bakar alternatif yang bisa didapatkan dari tanaman pati melalui proses biokimia. Mengingat Indonesia adalah negara dengan tanah yang subur, maka sumber bahan baku ini relatif mudah didapat, dan bersifat terbarukan. Bioethanol dapat digunakan dalam bentuk campuran dengan bahan bakar fosil, namun ada kecenderungan pencampuran bioethanol dengan bensin menghasilkan campuran yang tidak sepenuhnya homogen. Maka dari itu diperlukan suatu aditif yang dapat meningkatkan homogenitas campuran. Sehingga pada penelitian ini dilakukan uji penggunaan bahan bakar campuran bensin – bioethanol yang ditambahi aditif oksigenat, pada mesin spark ignition (SI). Kemudian dilakukan analisis terhadap kinerja mesin, emisi gas pembakaran, dan coefficient of variation (COV) di ruang bakar. Aditif yang digunakan yaitu cyclohexanol dan cyclooctanol dengan volume yang divariasikan. Pencampuran bioethanol dapat memperbaiki emisi gas buang, serta COV. Lalu ketika ditambahi aditif, didapat perbaikan pada specific fuel consumption (SFC) dengan emisi dan COV yang semakin membaik.

.....The dependency of Indonesian citizens to fossil fuel is very high and the amount were continuously increasing every time. At the same time, the capacity of oil refinery within the nation was being unable to cover the needs. As the result, the government of Indonesia have to do an import for some part of petroleum raw materials and also fuel products. Moreover, several parties had predicted that the recent global petroleum reserve were not far from its end limit of depletion. Also the environmental impact of combustion gas resulted from burning fossil fuel has further convincing people to find an alternative for fossil fuel. Bioethanol (C2H5OH) is one of potential fuel alternative which can be obtained through biochemistry process of starch plant. Considering that Indonesia is a country which has a fertile land, finding the source would not be a big problem. Bioethanol may be used in mixture form with fossil fuel, but there is a problem with homogeneity of the mixture. So that it requires an additive in which was able to increase the homogeneity of the mixture. As a result, in this research the examination were done by mixing the gasoline – bioethanol with oxygenated additives and use it as a fuel on unmodified spark ignition (SI) engine. Then going through the process of analysis for engine performances, exhaust gas emissions, and coefficient of variations (COV). The additive used is cyclohexanol and cyclooctanol in which the volume was variated. It

is an evident that the use of gasoline – bioethanol mixture resulted in better exhaust emission and COV. Then the addition of additives gives a further good effect to specific fuel consumptions (SFC), exhaust emission, and COV.