

## Sintesis Metil Selulosa dari Limbah Kertas sebagai Agen Pengental pada Gemuk Bio = Synthesis Methyl Cellulose from Paper Waste as Thickening Agent for Bio Grease

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### Abstrak

Gemuk komersial umumnya tersusun oleh minyak dasar, pengental dan aditif. Sebagian besar komposisi dari lemak komersial tidak ramah lingkungan. Hal tersebut dapat berdampak dan mempengaruhi lingkungan serta ekosistem perairan jika dibiarkan secara terus-menerus. Oleh sebab itu, perkembangan mengenai lemak ramah lingkungan mulai bermunculan dengan cara memodifikasi penggunaan minyak dasar, pengental, serta aditifnya. Salah satunya menggunakan turunan dari selulosa yaitu metil selulosa. Sementara itu, selulosa banyak ditemukan disekitar kita contohnya adalah limbah kertas HVS. Limbah kertas HVS melewati beberapa tahapan proses yaitu pre-treatment, alkali treatment, dan bleaching treatment untuk mendapatkan ekstrak serat selulosa. Metil selulosa disintesis menggunakan metode mercerization dengan NaOH serta metilasi menggunakan metilen klorida sebagai agen metilasinya. Penggunaan metil selulosa sebagai agen pengental pada lemak bio dilakukan dengan variasi 20,0; 22,5; 25,0; 27,5; 30,0 persen berat. Hasil penelitian menunjukkan bahwa metil selulosa yang dihasilkan memiliki gugus metilasi mengalami peningkatan dari 1160,14 cm<sup>-1</sup> pada selulosa menjadi metil selulosa-air 1411,99 cm<sup>-1</sup> yang mengindikasikan keberhasilan proses metilasi. Selanjutnya, metil selulosa pengental lemak bio dilakukan pengujian konsistensi, dropping point, dan jumlah keausan. Dari ketiga pengujian performa tersebut, dihasilkan bahwa metil selulosa memiliki pengaruh signifikan pada konsistensi, dropping point dan jumlah keausan bersamaan dengan penambahan jumlah komposisi pengental.

.....Commercial grease consists of base oil, thickener and additives. Most of the compositions of these commercial greases are not environmentally friendly. This could have an impact and affect the environment and aquatic ecosystems if allowed to continue. Therefore, the development of environmentally friendly greases began to emerge by modifying the use of base oils, thickeners, and additives. One of them uses a derivative of cellulose, namely methyl cellulose. Meanwhile, cellulose is found around us, for example, paper waste. Paper waste go through several stages of processing, namely pre-treatment, alkali treatment, and bleaching to obtain cellulose fiber extract. Methyl cellulose synthesized using mercerization and methylation methods using methylene chloride as the methylation agent. The use of methyl cellulose as a thickening agent in bio grease was carried out with variations of 20,0; 22,5; 25,0; 27,5; 30,0 percent by weight. The results showed that the methyl cellulose produced had an increased methylation group from 1160,14 cm<sup>-1</sup> in cellulose to 1411,99 cm<sup>-1</sup> methyl cellulose-water which developed the methylation process. Furthermore, the test for methyl cellulose thickener of bio grease tested for its consistency, dropping point, and amount of wear. From the three tests, it was found that methyl cellulose had less significant effect on the drop point and amount of wear but had a significant effect on consistency. From the three performance tests, it was found that methyl cellulose had a significant effect on the consistency, dropping point and amount of wear along with increasing the amount of thickening composition.