Pengaruh katalis Ni/ZrO2.SO4 terhadap hasil Ko-Pirolisis dan Hidrodeoksigenasi Trigliserida dengan Polipropilena untuk pembuatan biofuel = The effect of Ni/ZrO2.SO4 catalyst on Co-Pyrolysis and Hydrodeoxygenation results of Triglycerides with polypropylene for biofuel production

Didik Nur Sahid, author

Abstrak

Energi merupakan aspek penting penunjang kehidupan dan hingga saat ini terus dikembangkan pemanfaataannya.. Salah satu bahan bakar alternatif yaitu biofuel yang diperoleh dari bio-oil yang telah ditingkatkan kualitasnya sesuai dengan standar. Di pihak lain, buangan plastik yang didominasi polipropilen semakin hari semakin bertambah. Dalam penelitian ini menggunakan bahan baku RBDPO (refined, bleached, deodorised palm oil) yang mewakili crude palm oil dan plastik polipropilen sebagai donor hidrrogen radikal dan hasil pirolisisnya sebagai bagian dari hidrokarbon. Penelitian ini terdapat rangkaian proses slow thermal co-pyrolysis, catalytic co-pyrolysis dan hidrodeokigenasi. Slow thermal co-pyrolysis menggunakan umpan plastik polipropilena dengan laju pemanasan 10 , kemudian dalam proses catalytic co-pyrolysis menggunakan variasi massa katalis sebesar 3, 5, dan 7% dari massa umpan poliprolipena dan RBDPO. Penggunaan katalis Ni/ZrO2SO4 yang memiliki tingkat keasaman tertentu meningkatkan hasil yield bio oil dan kandungan oksigenat yang rendah. Selain itu katalis Ni/ZrO2SO4 (asam brosnted dan lewis) menyebabkan mid-chain scission PP sehinggaa distribusi panjang rantai karbon mengarah pada fraksi diesel. Efek dari penggunaan feed PP yang memberikan donor radikal hidrogen meningkatkan hasil yield bio oil dari 6% menjadi 68% menunjukkan efek sinergis antara RBDPO dan plastik polipropilena.
.....Energy is an important aspect of life support and until now its utilization continues to be developed. One of the alternative fuels is biofuel obtained from bio-oil with an increase in quality according to standards. On the other hand, plastic waste which is dominated by polypropylene is increasing day by day. In this study, the raw material used is RBDPO (refined, bleached, deodorised palm oil) which represents crude palm oil along with polypropylene plastic as hydrogen radical donors and the pyrolysis products as part of the hydrocarbons. This research contains a series of processes of slow thermal co-pyrolysis, catalytic co-pyrolysis and hydrodeoxygenation. Slow thermal co-pyrolysis using polypropylene plastic feed with a heating rate of 10/min, then in the catalytic co-pyrolysis process using a catalyst mass variation of 3, 5, and 7% of the mass of polypropylene and RBDPO feeds. The use of Ni/ZrO2SO4 catalyst with a certain level of acidity increases the yield of bio oil and has a low oxygenate content. In addition, Ni/ZrO2SO4 catalyst (Brosnted and Lewis acids) causes mid-chain scission of PP, so that the distribution of carbon chain length leads to the diesel fraction. The effect of using PP feed which provides hydrogen radical donors increases the yield of bio oil from 6% to 68%, indicating a synergistic effect between RBDPO and polypropylene plastic.