

ABSTRAK

KARAKTERISTIK FUNGSIONALITAS DAN MIKROSTRUKTUR ASPAL-KARBOSIL KOMPOSIT

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Sintesis karbosil telah dilakukan dengan bahan dasar silika sekam padi dengan metode pirolisis dan metode pencampuran aspal-karbosil yang digunakan yaitu metode padatan. Komposit aspal-karbosil dengan massa aspal masing-masing sampel 0 g; 1,0 g; 1,5 g; 2,0 g; 2,5 g; dan 3,0 g, sedangkan massa karbosil masing-masing sampel 10 g; 9 g; 8,5 g; 8 g; 7,5 g; dan 7 g. Perubahan gugus fungsi, dan mikrostruktur komposit aspal-karbosil dipengaruhi oleh variasi perbandingan aspal-karboosil yang digunakan. Hasil FTIR menunjukkan adanya gugus fungsi O-H, Si-O-Si, Si-O, C-H, dan C=O. Selain itu, hasil analisa SEM menunjukkan adanya retakan dan gumpalan yang bervariasi pada masing-masing sampel. Komposisi unsur yang terbentuk sampel aspal-karbosil adalah C, Si, O, dan N. Penambahan kandungan aspal menyebabkan persentase C meningkat. Hasil uji fisis menunjukkan bahwa semakin banyak aspal yang ditambahkan maka nilai densitas meningkat dan nilai daya serap menurun, selain itu, nilai kekerasan tertinggi pada sampel dengan perbandingan aspal karbosil 30:70 sebesar 139,97 kgf/mm². Hasil penelitian ini menunjukkan bahwa komposit aspal-karbosil mempunyai potensi sebagai bahan campuran untuk jalan raya.

Kata kunci: sekam padi, karbosil, aspal, *FTIR,SEM*, metode pirolisis, aspal-karbosil.

ABSTRACT

FUNCTIONALITY CHARACTERISTICS AND MICROSTRUCTURE OF ASPHALT-CARBOSIL COMPOSITES

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Synthesis carbosil has been carried out with the basic material of rice husk silica using the pyrolysis method and the asphalt-carbosil mixing method which used was the solids method. Asphalt-carbosil composites with asphalt mass for each samples are; 0 g; 1.0 g; 1.5 g; 2.0 g; 2.5 g; and 3.0 g, while the carboxyl mass of each samples are 10 g; 9 g; 8.5 g; 8 g; 7.5 g; and 7 g. Changes of the functional groups and the microstructure of the asphalt-carbosil composite were affected by the variation of the asphalt-carbosil ratio. The FTIR results shows the presence of functional groups O-H, Si-O-Si, Si-O, C-H, and C=O. In addition, the results of the SEM analysis shows that there are various cracks and lumps in each sample. The elemental compositions of the asphalt-carbosil samples are C, Si, O, and N. The addition of asphalt content causes the increasing of C percentage. The results of the physical test shows that the more asphalt was added, the density value increases and the absorption value decreases, in addition, the highest hardness value in the sample with a ratio of 30:70 carbosil asphalt is 139.97 kgf/mm^2 . The results of this study indicates that the asphalt-carbosil composite has the potential as a mixture for highways.

Keywords: rice husk, carbosil, asphalt, FTIR, SEM, pyrolysis method, asphalt-carbosil.