

## Sintesis dan kinetika swelling selulosa jerami padi-cangkok-poli (asam akrilat-ko-akrilamida) = Synthesis and swelling kinetics of cellulose of rice straw-g-poly (acrylic acid-co-acrylamide)

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### Abstrak

Kopolimerisasi selulosa jerami padi dengan asam akrilat dan akrilamida menghasilkan superabsorben komposit. Selulosa diisolasi dari jerami padi dengan tahapan ekstraksi lipid dengan toluena: etanol (2:1). Penghilangan hemiselulosa dan lignin dengan menggunakan kalium hidroksida 5% dan hidrogen peroksida 2% pH basa suhu 90°C. Rendemen selulosa yang diperoleh adalah 21,56% dengan Indeks kristalinitas 71,43%. Spektrum FTIR selulosa menunjukkan hilangnya serapan lignin pada 1728 cm<sup>-1</sup>. Kopolimerisasi berlangsung pada suhu 65°C dengan dialiri gas nitrogen. Inisiator dan pengikat silang yang digunakan adalah kalium persulfat dan N,N-metilena bis akrilamida. Superabsorben yang dihasilkan menunjukkan kapasitas swelling air; larutan urea, kalium dihidrogen fosfat, ammonium klorida konsentrasi 100 ppm masing-masing adalah 895,48g/g ; 986,72g/g; 448,98g/g dan 387,11g/g. Superabsorben bersifat anionik yang dapat mengikat ammonium. Kinetika swelling memenuhi persamaan orde pseudo-kedua dan kinetika absorpsi memenuhi persamaan orde pseudo-kedua.

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Copolymerization of cellulose from rice straw with acrylic acid and acrylamide monomer produce composite superabsorbent. Cellulose was isolated from lipid content by extraction with toluene : ethanol (2:1). Hemicelluloses and lignin were removed by using 5% potassium hydroxide and 2% hydrogen peroxide at alkaline pH at 90°C. Cellulose yield obtained was 21.56% with 71.43% crystallinity index. FTIR spectra of lignin showed a loss of absorption at 1728 cm<sup>-1</sup>. Copolymerization was carried out at 65°C under nitrogen atmosphere. Initiator and cross linking agent used were potassium peroxydisulfate and N,N-methylene bis acrylamide. Superabsorbent resulted from this experiment showed the water swelling capacity for the solution of 100 ppm of urea, potassium dihydrogen phosphate, ammonium chloride respectively 895.48 g / g, 986.72 g / g, 448.98 g / g and 387.11 g / g. Superabsorbent produced are anionic, that can bind ammonium cation. The kinetics of swelling and absorption was following pseudo-second order equation.