

Sintesis nanokomposit superabsorben natrium alginat ganggang coklat tercangkok poli (akrilat-akrilamida) sebagai pupuk lepas lambat =
Synthesized of nanocomposite superabsorbent sodium alginate from brown algae grafting by poly acrylic acid co acrylamide as slow release fertilizer

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Abstrak

Penelitian ini bertujuan untuk membuat pupuk slow-release nanokomposit superabsorben. Sintesis pupuk slow-release nanokomposit superabsorben dilakukan dalam 4 tahap. Tahap pertama, isolasi natrium alginat dari ganggang coklat diperoleh rendemen natrium alginat sebesar 44,32% dengan berat molekul 10163,819 g/mol. Keberhasilan isolasi didukung dengan karakterisasi menggunakan FTIR, XRD, SEM dan DSC. Tahap kedua, sintesis superabsorben nanokomposit menggunakan natrium alginat sebagai backbone, asam akrilat dan akrilamida sebagai monomer, kalium persulfat sebagai inisiator dan N,N-metilena bisakrilamida (MBA) sebagai pengikat silang serta zat anorganik bentonit sebagai filler. Kapasitas swelling superabsorben nanokomposit terbaik sebesar 576 g/g dan kapasitas swelling dan release terhadap larutan urea sebesar 629 g/g, dan 15 %. Hasil ini didukung dengan karakterisasi menggunakan FTIR, SEM dan DSC. Komposisi terbaik ini digunakan untuk sintesis pupuk slow release dengan metode polimerisasi insitu diperoleh kapasitas swelling air sebesar 638 g/g dan kapasitas release sebesar 72,76 %. Pupuk slow release dikarakterisaasi dengan FTIR dan SEM.

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Superabsorbent nanocomposite fertilizer was synthesized in four steps. Initially, isolation alginate sodium from brown algae by extraction method. Sodium alginate obtained from extraction of brown algae used as the backbone for the synthesis of superabsorbent nanocomposite copolymerization.. The rendement of sodium alginate obtained was 44.32% with molecular weight of 10163,819 g/mol from measurement the intrinsic viscosity. The product isolation was characterized by FTIR, XRD, SEM, and DSC. The next step was synthesis of nanocomposite superabsorbent by acrylic acid and acrylamide as monomer, sodium alginate as backbone, potassium persulfate as inisiator, MBA as crosslinker and bentonite as filler by radical polimerization method. Optimazation of composition nanocomposite superabsorbent was done by swelling capacity. The results of swelling capacity in water gave 576 g/g for SA3 while swelling and release in urea solutions gave respectively 629 g/g and 15%. SA3 was characterized by FTIR, SEM, and DSC. The composition in synthesis of SA3 was used to synthesized slow release fertilizer and characterized by FTIR and SEM. Swelling and release capacity of fertilizer was 638 g/g and 72,76 % respectively