

Hikmah, Aulia M., 2016, Pembuatan dan Karakterisasi Komposit Natrium Alginat-Kitosan dan *Polyethylene Glycol* (PEG) sebagai Cangkang Kapsul, skripsi ini dibawah bimbingan Siti Wafiroh, S.Si, M.Si dan Dr. Pratiwi Pudjiastuti, M.Si, Departemen Kimia Fakultas Sains dan Teknologi, Universitas Airlangga, Surabaya.

ABSTRAK

Kapsul komersial yang terbuat dari gelatin memiliki ketahanan terhadap air sangat rendah. Oleh karena itu, diperlukan alternatif material kapsul untuk meningkatkan kinerja tersebut. Penelitian ini bertujuan untuk membuat dan mengkarakterisasi komposit alginat-kitosan dan *plasticizer* PEG sebagai cangkang kapsul. Natrium alginat diekstraksi dari rumput laut coklat (*Sargassum sp.*) melalui jalur asam alginat. Cangkang kapsul dibuat dengan 5 variasi (b/b) perbandingan alginat:kitosan yakni 2:1; 3:1; 4:1; 5:1; 1:3 (b/b) ditambah dengan *plasticizer* PEG 20% (b/v). Karakterisasi yang dilakukan meliputi uji sifat mekanik, uji *swelling* air, uji disolusi, uji FTIR, dan uji SEM. Dari hasil uji mekanik yang dilakukan dalam penelitian ini diperoleh cangkang kapsul optimal yaitu dengan komposisi perbandingan alginat-kitosan 2:1 (b/b) yang memiliki nilai *stress* sebesar $1,05 \times 10^3$ kN/m², nilai *strain* sebesar 0,11, nilai Modulus Young sebesar $9,61 \times 10^3$ kN/m², dan persentase *swelling* air sebesar 72,26%. Hasil uji disolusi menggunakan 3 media disolusi pH (1,2; 4,5; 6,88) menggunakan obat *paracetamol* memiliki persentase *release* masing-masing sebesar 79,53%; 98,81%; 73,42%, sedangkan kapsul komersil yakni 85,31%, 85,68%, 75,95%. Dengan demikian, komposit natrium alginat-kitosan dapat digunakan sebagai cangkang kapsul.

Kata kunci : alginat, kitosan, *polyethylene glycol*, cangkang kapsul

Hikmah, Aulia M., 2016, Production and Characterization of Sodium Alginate-Chitosan and PolyEthylene Glycol as Coating Capsule, this final project was under guidance of Siti Wafiroh, S.Si, M.Si and Dr. Pratiwi Pudjiastuti, M.Si., Departement of Chemistry, Faculty of Science and Technology, Airlangga University, Surabaya.

ABSTRACT

Commercial capsules are made from gelatin, which are water low resistance. Therefore, an alternative material is required to improve the performance of the capsules. The aims of this research are to create and to characterize composite of alginate-chitosan and the plasticizer PEG as capsule shells. Sodium alginate was extracted from brown seaweed of *Sargassum sp.* through alginic acid pathway. The capsule shells were made with 5 mass variations (w/w) ratio of alginate-chitosan which are 2: 1; 3: 1; 4: 1; 5: 1; 1: 3 with plasticizer 20% of PEG (w / v) of each composite. Characterizations of capsule were conducted to determine mechanical properties, such as water swelling, dissolution, FTIR and SEM tests. The mechanical tests were obtained the optimum capsule shells with alginate-chitosan ratio of 2: 1 (w / w). The values of stress, strain, and modulus Young, and the water swelling percentage are 1.05×10^3 kN/m², 0.11, 9.61×10^3 kN/m², and 72.26%, respectively. The dissolution test was performed using three pH solutions include 1.2; 4.5; and 6.88. Paracetamol was used as filling drug of capsule shells. The release percentage of sodium alginat-chitosan capsules are 79.53%; 98.81%; 73.42%, while the commercial capsule are 85.31%, 85.68%, 75.95% respectively. Sodium alginate-chitosan composite can be used as the capsule shells.

Keywords: alginate, chitosan, polyethylene glycol, capsule shell