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## Utilization of chitosan from snail shells with modifications nano Ag-chitosan for selective detection of heavy metal ions with EDTA

Oktavian Zulfiky, Muhammad Jazuli and Arif Suhendar  
University of Brawijaya, Indonesia

Snails in Indonesia have been cultivated as a source of protein and for export. Snail export in 1983 reached 245 359 kg, while in 1987 increased by about seven -fold to 1,490,296 kg. This led to the emergence of increased trade waste snail shells in large quantities. It is made with chitosan by deacetylation of chitin process using Knorr with addition of 60% NaOH at a ratio of 20:1 (v/w) and at 100-140°C for 1 hour. After chilling, filtered and the solid obtained was neutralized with distilled water. The solid was then dried in an oven at a temperature of 80°C for 24 hours and chitosan prepared were analyzed. Chitosan was identified using infrared spectrophotometer instruments and X-ray diffraction. Synthesis of nano-Ag is done by reducing  $\text{AgNO}_3$  with  $\text{NaBH}_4$ . Nano Ag nanocolloid modified with chitosan (Ag @ kit) was previously prepared by the hydrolysis of chitosan with  $\text{CH}_3\text{COOH}$ . Nano Ag and Ag @ kit characterization are done using UV-Vis spectrophotometer and PSA. Synthesis of nano-Ag was conducted with  $\text{NaBH}_4$  concentration and time variation reduction, whereas the synthesis of nano-Ag @ kit max was observed at 393 nm and showed a size of 3.672 nm. With increasing time reduction, nano- Ag undergoes agglomeration, but with the modification of nano-Ag @ Ag nano kit causees stability. Nano Ag @ kit was applied for the detection of heavy metal ions. The results showed that nano- Ag @ kit can detect selective ion Hg (II) and Cu (II) ion than Cd (II), Co (II), Fe (III), Pb (II) and Zn (II). The optimum pH for the detection of Hg (II) and Cu (II) are 3.9 and 4.5. Regeneration Ag @ kit - Hg (II) and Ag @ kit - Cu (II) was conducted by EDTA, which resulted in re- Ag @ kit, Hg (II) and Cu (II) attracted by EDTA.

### Biography

Oktavian Zulfiky graduated in 2006 and he continued his study in 3rd Junior High School (SMPN 9 Surabaya). In 2006 he continued his study in 4th Vocational High School (Chemical Engineering) in the city of Surabaya. He finished his study in 2013 and continued again for his first degree (S1) in State Brawijaya of University, in Malang. He took English Education Department on Mathematics and Natural Science Faculty.

sains\_zulfiky@rocketmail.com