

Studies on Galvanic Replacement Method: Substitution of Silver Nanorods with Gold

권순일^{1,2}, 이인호^{1,2}, 김형태¹, 안성준^{1,2}, 고원건¹, 이상엽^{1,*}
¹연세대학교 화공생명공학과; ²수소연료전지 특성화 대학원
(leessy@yonsei.ac.kr*)

In this study, the galvanic replacement reaction was investigated. As an example of replacement reaction, silver nanorods were replaced with gold forming gold nanotubes. Due to the standard reduction potential difference between silver and gold ions, the solid silver was replaced with gold voluntarily at room temperature. Tubular gold nanostructures were obtained after reaction of silver nanorods suspension reacted with precursor of Gold(III) chloride trihydrate. In addition to the microscopic observation, kinetics study on the replacement reaction was also carried out. The progress of replacement reaction was monitored at different reaction conditions with time. From the kinetics data, the reaction rate constant was determined. This study investigated on the kinetics on the galvanic replacement reaction for the first time as far as we know. It would provide fundamental information on the reaction rates. The outcome of this study would contribute to the development of process useful to synthesize novel functional materials.