

CNT-modified Electrodes for PEC Application

김재영, 전휘찬, 이재성*
포항공과대학교
(jlee@postech.ac.kr*)

Photocatalysts for water splitting, such as iron oxide, often have a problem from their bad electrical conductivity. This problem makes photo-generated electrons easy to recombine. In this study, carbon nanotube(CNT) is used for overcoming their bad electrical conductivity. CNT acts as a conductive network, and helps both capture and transport excited electrons to the electrode surface. For this objective, some parameters are important. First, to make surface area of CNT as large as possible is effective factor for improving photoelectrochemical(PEC) efficiency. This factor means a more opportunity to meet CNT and iron oxide particles. Acid treatment of CNT is good for etching and functionalizing CNT to make larger surface area. Various acid treatment conditions were carried in this study. Second, because CNT has both good and negative effects at PEC efficiency(for example, blocking the light), the ratio of CNT and iron oxide has to be controlled carefully. The valuation of performance of PEC cell will process through measurement of photocurrent first. Characterization of CNT and iron oxide will also important for finding out fundamental PEC reaction. Especially electrochemical impedance spectroscopy will be a useful instrument to understand PEC system.