

암모니아성 질소가 미생물연료전지에서 전류 발생에 미치는 영향

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Effect of ammonium on the current generation in the microbial fuel cell

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These studies carried out to know the effect of ammonium on the current generation in the microbial fuel cells (MFCs). MFCs used in the study were enriched with anaerobic digestion sludge and operated for 3 years using artificial wastewater (AWW). When the current was stably generated, ammonium ion with 27.0 ± 0.0 , 51.5 ± 0.0 , 103.5 ± 0.0 mg/L with acetate fed into the anode compartment. The current values under condition included ammonium were changed from its initial 6.30 ± 0.06 to 6.28 ± 0.36 , 5.95 ± 0.61 , 5.64 ± 0.38 mA, respectively. The current value was slightly decreased to 5.64 ± 0.38 mA compared to 6.30 ± 0.06 mA generated from MFC without ammonium ion in the AWW. But After 3days operating under ammonium concentration with 103.5 ± 0.0 mg/L, the current was unstably generated when artificial wastewater without ammonium was fed again. MFC enriched with AWW without ammonium ion was inhibited by high concentration of ammonium. At this time, the ammonium was removed 5.27~16.41 mg per day under all conditions.

Key words : Microbial fuel cell, Ammonium, Current generation

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함산소불소화 효과에 의한 전기방사 활성탄소나노섬유의 CO₂ 저장

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Effect of oxyfluorination on activated electrospun carbon nanofibers for CO₂ storage

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The oxyfluorination effects of electrospun carbon nanofibers (OFACFs) were investigated for CO₂ storage. Carbon nanofibers were prepared from poly acrylonitrile / N,N-dimethylformamide solution through electrospinning method and heat treatment. Chemical activation of carbon nanofibers were carried out in order to improve the pore structure. And the surface modification of activated carbon nanofibers was conducted by oxyfluorination to improve the CO₂ storage on effect of introduced functional groups. The samples were labeled CF (electrospun carbon nanofiber), ACF (activated carbon nanofibers), OFACF-1 (F₂:O₂ = 3:7), OFACF-2 (F₂:O₂ = 5:5) and OFACF-3 (F₂:O₂ = 7:3). The functional group of OFACFs was investigated by x-ray photoelectron spectroscopy analysis. The specific surface area, pore volume and pore size of OFACFs were calculated and pore shape was estimated by the BET equation. Through the adsorption isotherm, the specific surface area and pore volume significantly decreased by oxyfluorination.

Key words : Electrospinning(전기방사), Carbon Nanofibers(탄소나노섬유), Chemical Activation(화학적 활성화), Oxyfluorination(함산소불소화), CO₂ storage(이산화탄소 저장)

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