

Direct CH₄ carbonylation by CO₂ to form acetic acid over BiOI catalyst

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The development of efficient catalytic system for the direct synthesis of acetic acid from the carbonylation of CH₄ by CO₂ is significant for the potential utilization of these greenhouse gases. Herewith we demonstrate the BiOI as a promising catalyst for this reaction using H₂O₂ as an oxidant. At room temperature, CH₄ carbonylation over BiOI catalyst was carried out using dimethyl sulfoxide as solvent and produced considerable acetic acid with high selectivity. From the general catalytic performance tests under various reaction conditions, BiOI displayed better performance compared to BiOIO₃ and BiOI/BiOIO₃ hetero structures which were tested as catalyst for comparison. This work was supported by Basic Science Research Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education (NRF 2017R1D1A1B03036324).