

이산화탄소 전환용 고효율 세슘계 촉매를 이용한 디알킬우레아와 디카바메이트 제조기술 (Highly efficient Cs-based catalyst for CO<sub>2</sub> conversion to generate dialkylurea as a precursor to dicarbamate)

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1,3-Disubstituted ureas (DSUs) are widely used as intermediates in the production of fine chemicals, agrochemicals, and bioactive molecules. Besides, DSUs can be readily transformed to corresponding carbamates via alcoholysis. Methylene diphenyl 4,4'-dicarbamate (MDC) is also an important precursor for producing methylene diphenyl diisocyanate (MDI). They have been conventionally produced via a toxic phosgenation, thus large amounts of hydrochloric acid are produced as by-products. In this session, we report M[Azd] (M=alkali metal, Azd=imidazolid, triazolide, benzotriazolide) and azo-bridged Cs<sup>2+</sup> phenolate/triazolide compound, and its application as an effective catalyst for the carboxylation reaction of amines with CO<sub>2</sub> to deliver DSUs in high isolated yields without any dehydrating agents. Among them, Cs<sup>2+</sup> phenolate/triazolide catalyst was found to show highest TOF number of 858 h<sup>-1</sup>. Additionally, we report a K30 montmorillonite-supported tungstophosphoric acid (TPA) as an active catalyst in the condensation reaction of MPC, which are all important precursors for diisocyanates.