

# 저온 CO<sub>2</sub> 액화 및 흡착용 다공성 유무기 하이브리드 흡착제 개발



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Development of porous hybrid adsorbents for CO<sub>2</sub> liquefaction and adsorption at low temperature

### 최종연구목표

- 저온 CO<sub>2</sub> 액화용 나노세공체 소재 및 흡착형 액화공정 개발

### 주요연구내용

- 하이브리드 나노세공형 흡착제를 이용한 연속식 흡착형 CO<sub>2</sub> 액화기술 개발
- 저온 CO<sub>2</sub> 액화소재로서 하이브리드 나노세공형 흡착제의 합성 및 성형기술 개발

### 기대효과

- 국내 화력발전소에서 배출된 CO<sub>2</sub>의 다단계 포집공정과 연계된 저온 CO<sub>2</sub> 액화공정에 개발된 신기술 적용
- 저온 흡착형 CO<sub>2</sub> 액화공정에 개발된 하이브리드 흡착제 적용

### Research Goals

- Development of porous hybrid CO<sub>2</sub> adsorbents for low temperature CO<sub>2</sub> liquefaction and a new adsorptive process of CO<sub>2</sub> liquefaction using the porous hybrid

### Research Contents

- Development of continuous adsorptive CO<sub>2</sub> liquefaction by using porous hybrid adsorbents
- Design of porous hybrid adsorbents and development of their synthesis technology

### Expected Effects

- Application to a new technology on low temperature CO<sub>2</sub> liquefaction connected with a multistage capture process of CO<sub>2</sub> emitted from domestic power plants fueled by fossil fuels
- Application of porous hybrid adsorbents to low temperature adsorptive CO<sub>2</sub> liquefaction process

## 기술개발 TRM

Core Tech	Stage 1		Stage 2	Stage 3
	2011~2012	2012~2013	2013~2014	2014~2016
Evaluation System	Set-up of evaluation system for low temp. CO <sub>2</sub> liquefaction  Technology development for CO <sub>2</sub> liquefaction performance evaluation			
Porous Hybrid Adsorbents		Evaluation of porous hybrid adsorbents for CO <sub>2</sub> liquefaction at low temp.  Surface functionalization of porous materials for liquefaction speed up	Pore size & surface control	Shaping of porous hybrid adsorbents  Preparation scale up  Minimization of interparticular void fraction
CO <sub>2</sub> Liquefaction Process				Continuous adsorptive CO <sub>2</sub> liquefaction process  Combination with CO <sub>2</sub> capture process