

FUNDING PROGRAM FOR NEXT GENERATION WORLD-LEADING RESEARCHERS

Project Title: Construction of Carbon Dioxide Physical Absorption Process using Ionic Liquid

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1. Background of research

One of global warming technology has been developed for separating and recovering carbon dioxide storage and sequestration, however, the current technology have a significant problem of regeneration cost for the absorbent of carbon dioxide selectively separated from thermal power plants and other large-scale fixed.

2. Research objectives

In the present study, the absorbent (ionic liquids) can be driven at the room temperature will be synthesized. The absorbent will be clarified the mechanism of dissolution with the gas and the effect of gas absorption from the estimation model. The low-cost absorption process for greenhouse gas will be driven for construction.

3. Research characteristics (incl. originality and creativity)

The carbon dioxide recovery process using ionic liquids can be built up simple operation of temperature and pressure changes. Carbon dioxide can also be recovered as liquefied or high pressure condition in the advantageous of isolation and storage. Thus, the energy cost can be significantly reduced, compared with the conventional techniques are required a huge energy cost for the absorbent regeneration.

4. Anticipated effects and future applications of research

The expected results of present study, the use of ionic liquids will be increased as electrochemical device, chemical reaction solvent, and catalyst. Therefore, the chemical process using volatile organic compound (VOC) slough off and can be expected to switch to environment-friendly process.

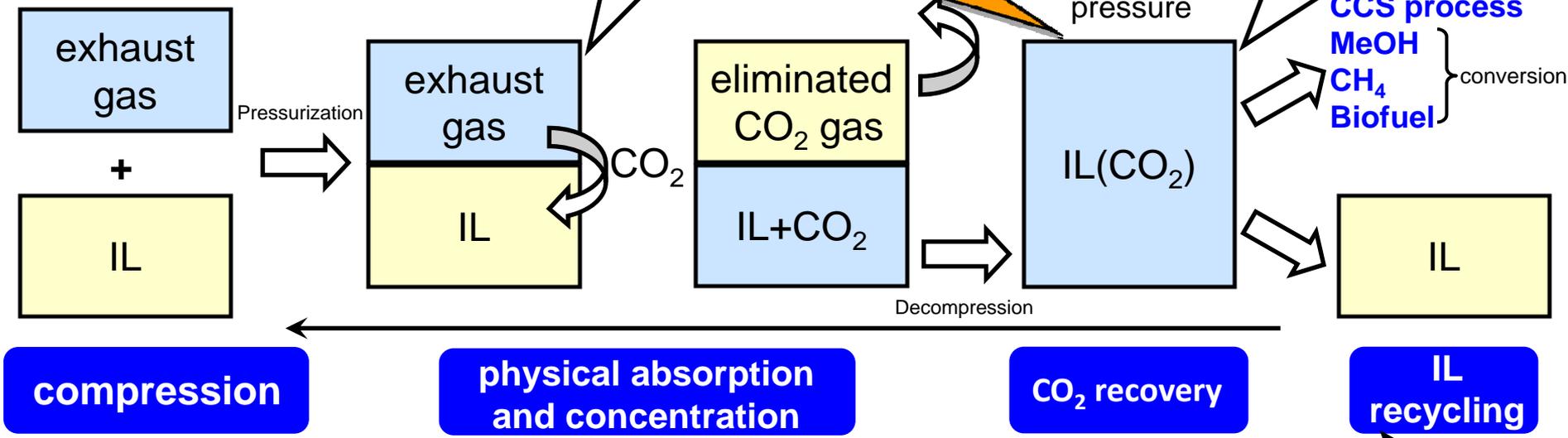
ILs-CO₂ absorption and recycling process

IGCC: Integrated coal Gasification Combined Cycle



- absorption amount
- selectivity
- absorption rate

- phase condition for IL + CO₂
- density difference for IL + CO₂
- release rate of CO₂



Feature of this process

- ✓ Physical absorption **at normal temperature**
- ✓ **Only of pressure control operation**
- ✓ Direct recovery of high pressure CO₂
- ✓ Gas absorbent recycling energy minimization

- vapor pressure of IL
- chemical stability of IL
- refill (pressure) process

absorbent: from amines to ionic liquids