Fluidization Technology

Chemical Technology

Chulalongkorn University

Project Goal :

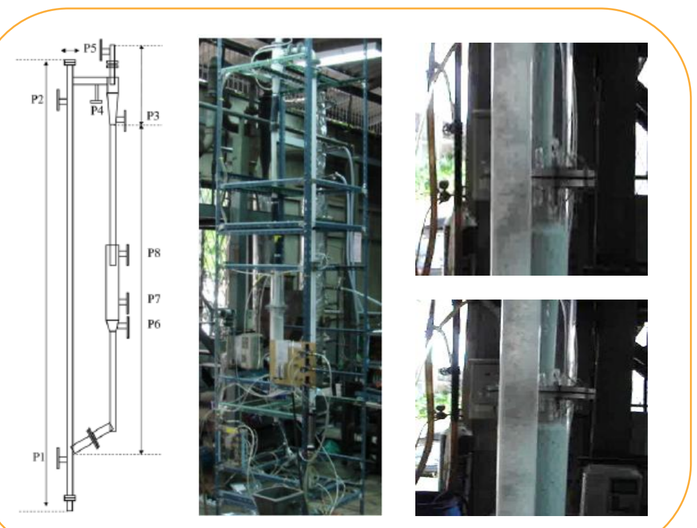
The research group focuses on developing the fluidization technology, as well as the fixed bed technology, for applying in various conventional and innovative applications which are combustion, gasification, fluid catalytic cracking, drying and carbon dioxide sequestration. The ultimate goal of the project is that the research center has its own technology in design and operation of fluidization technology which has high system efficiency and less impact on the environment.

Objectives :

- **To develop the knowledge in fluidization technology for combustion, gasification, fluid catalytic cracking, drying and carbon dioxide sequestration applications.**
- **To develop research facilities for conducting experiments and theoretical numerical simulation.**
- **To develop the human resources in fluidization technology.**

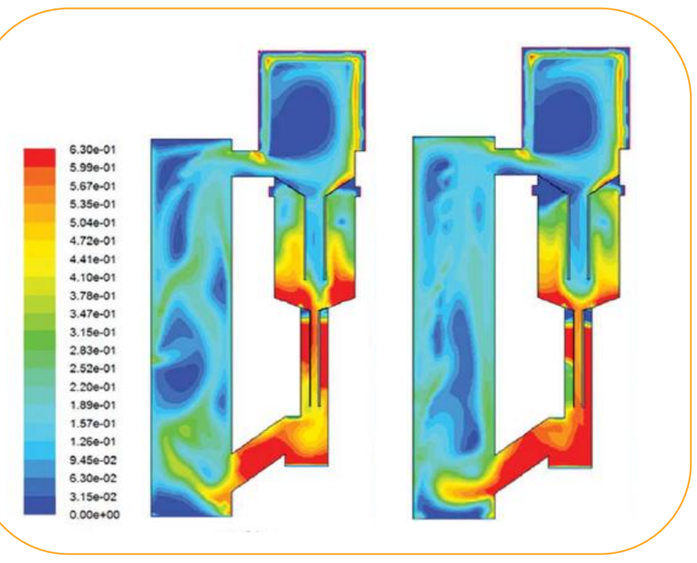
Rationale :

Fluidization is a worthwhile phenomenon since it provides homogeneous mixing, high heat transfer and easy to handle with various characteristics of feed. From this reason, fluidized bed reactor is currently used as a coal combustor for power generation. Moreover, fluidization technology can also be applied in many innovative applications which are gasification, fluid catalytic cracking, drying and carbon dioxide sequestration. Thus, there is a demand in term of understanding its fundamental characteristics so that in the near future the research group can design and improve the current technology in the necessity directions without depending upon foreign technology.



Research Themes :

- **Hydrodynamics in fluidized bed reactor.**
- **Gasification of biomass / plastic waste in fixed and fluidized bed reactor.**
- **Combustion of coal / biomass in fluidized bed reactor.**
- **Carbon dioxide sequestration from flue gas in fluidized bed reactor.**
- **Drying of agricultural product in fluidized bed reactor.**



Equipments :

- **Cold flow fluidized bed / circulating fluidized bed experimental units**
- **Hot flow fluidized bed / circulating fluidized bed experimental units**
- **Analytical units (Gas Chromatography, Particle Image Velocimetry and etc.)**
- **Computational fluid dynamics (ANSYS FLUENT) / CAD (GAMBIT) software**
- **ASPEN / HYSYS software**

Collaborations :

- **Illinois Institute of Technology, Chicago, USA**
- **The University of Tokyo, Tokyo, Japan**
- **Yonsei University, Seoul, Korea**
- **Chinese Academy of Sciences, Beijing, China**

Research Members :

- **Assoc. Prof. Dr. Pornpote PIUMSOMBOON**
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