

Thailand: Catalyst Evaluation Technology



Seminar participants

In November 2003, a four-member expert team consisting of two JCCP lecturers traveled to Thailand to host a seminar on “Catalyst Evaluation Technology” at PTT Plc. Co., Ltd.’s Research and Technology Institute (hereinafter referred to as PTT, R&TI). Plans for the implementation of this seminar had been under consideration since 2002 as part of the Expert Service for fiscal 2003. The theme and scheduling of the seminar was finalized



Q&A session

after meticulous coordination and adjustments, and was held from November 10 to 17, 2003, at PTT R&TI in Wangnoi.

Since overcoming the 1997 economic crisis, Thailand has achieved dramatic economic growth in recent years and is steadily on its way toward globalization. Its oil industry is also showing strong potential, with PTT R&TI aggressively engaging in new development and projects and with its refineries making various efforts to upgrade their products, promote energy conservation, and prevent environmental pollution. Catalysts are an essential part of these efforts, and "Catalyst Evaluation Technology," the theme of the seminar, is highly important in securing profitability and evaluating capital investments.

Overview

1. The Role of R&D

Mr. Masamitsu Takano lectured on the role of the research institute, head office, and refinery in activities pertaining to the development of catalysts, giving an example of an actual Japanese company that has a research institute. He also described basic design elements for introducing a pilot plant. Furthermore, in conjunction with the theme of the seminar, he explained the latest technologies for supplying and withdrawing catalysts, and preliminary activation.

2. Catalyst Management in Refinery

From among the numerous types of catalysts used in refineries, Tetsuji Kubota focused on FCC and HDS catalysts (vacuum gas oil and ultra deep-desulfurized gas oil), and lectured on equipment design conditions, operation procedures, daily management techniques, testing methods, product management, and other aspects of the manufacturing site. The lecture also touched upon the application, alteration, and selection of catalysts for use in long-term continuous operations.

3. FCC Catalyst Monitoring and Optimization

After presenting an overview of a catalyst manufacturer's research institute and plant, Mr. Tatsuo Masuda

of Catalysts and Chemicals Industries, Co., Ltd. (CCIC) covered the basics of the reaction theory and manufacturing method of FCC catalysts. He then described the features of MAT, ACE-MAT and Large Scale as pilot plants for evaluating catalysts, balanced catalysts and their degradation, performance monitoring and evaluation, and performance evaluation software (simulators). Furthermore, in regards to some of the latest technologies, Mr. Masuda introduced tailor-made catalysts created in response to specific needs of different customers, such as RON improvement, LPG and gasoline increase, and the functions of additives in such situations as CO combustion, reduction of sulfur content in products, and SOx reduction.

4. HDS Catalyst Development

Mr. Hideki Godo of Cosmo Research Institute introduced the newest developments in catalysts that are being pursued at the research institutes of oil companies today, and gave his professional views on pilot plant design and operation, as well as the mechanism, principle and calculation methods of catalyst activation and degradation. During his lecture, discussions were also held regarding the role of active metals (Mo, Co, Ni, W, P, etc.) in carriers (Al_2O_3 , TiO_2 , Zeolite, ZuO_2 , etc.) and their effects on catalyst performance.

Seminar Overview

Title: Catalyst Evaluation
 Date: Nov. 10 – 14 & 17, 2003
 Venue: PTT R&TI (Wangnoi)

Lectures and Lecturers:

Masamitsu Takano	JCCP Training Dept.	The Role of R&D
Tetsuji Kubota	JCCP Training Dept.	Catalyst Management in Refinery
Tatsuo Masuda	Catalysts and Chemicals Industries, Co., Ltd. (CCIC)	FCC Catalyst Monitoring and Optimization
Hideki Godo	Cosmo Research Institute	HDS Catalyst Development

*FCC: Fluid Catalyst Development

*HDS: Hydro Desulfurization

Over a period of six days, the entire seminar specifically examined the highly specialized topic of “Catalyst Evaluation Technology.” Precisely because of the specificity of the topic, only ten researchers participated in this seminar. However, besides researchers, more than twenty people involved in the business end of catalysts also attended and actively participated in the discussions.

Visit to a refinery

We had the opportunity to visit two refineries in Thailand, the Bangchack Refinery and Sriracha Refinery. The former is a hydroskimming type refinery. Its facilities were highly organized and clean, and it served as a testament to the refinery’s strong commitment to environmental management. Thai Oil’s Sriracha Refinery is the largest petroleum refining facility in Thailand, as well as one of the most modern refineries in Asia, and is capable of responding to the wave of globalization occurring most especially in terms of gas oil production. We were told that the refinery ranks high in the Solomon Study.

Preliminary discussion on a study tour in Japan

After successfully completing the seminar, we discussed the possible



Closing ceremony

implementation of a study tour in Japan for PTT, R&TI personnel. Since there were no plans for study tours in 2003, both parties agreed that it would be a good idea to consider holding one in 2004.

Overall impressions

Accompanying its rapid economic growth and prompted by the government’s 30-Year Energy Plan toward globalization, Thailand is experiencing a flurry of infrastructure developments, including “sky trains” and more highways. However,

especially at this stage of development, environmental considerations are essential, and the need for high-quality fuel is increasing the significance of catalyst evaluation.

From a broader perspective, it is more important than ever before for Japan and Thailand to strengthen their relationship through even more appropriate and mutual technical cooperation schemes to pave the way toward globalization.

*<Reported by Tetsuji Kubota,
Master Lecturer, Training Dept.>*