

Survey on Cooperation Research about Catalyst and Process Examination for Effective Hydrotreatment of Kuwait Crude Fractions

This study was implemented as a JCCP Technical Cooperation Project funded by the subsidy of the Ministry of Economy, Trade and Industry (METI) for projects in oil-producing countries, with the participation of JGC Catalysts and Chemicals Ltd. and Kyushu University.

1. Background

From fiscal 2010 to 2012, JCCP and Kuwait Institute for Scientific Research (KISR) implemented a joint project to establish a method for the analysis of the molecular species of crude oil and its products, and successfully applied desulfurized catalysts produced in Japan to the hydrotreatment of crude oil fractions. Owing to this project, JCCP has won stronger confidence from KISR, and was able to build a foundation for future business opportunities between oil industry businesses and universities in Japan and research institutes in Kuwait.

Another significant achievement has been JCCP's establishment of a relationship of trust with Kuwait National Petroleum Company (KNPC) through meetings that have been held more than a dozen times between JCCP, KISR and KNPC.

Based on the results of the joint project that had been achieved by fiscal 2012, the study aims to examine the

applicability of Japan's latest catalysts and processes to the hydrotreatment of light gas oil (LGO) and atmospheric residue (AR) of new Kuwait heavy crude oil, and to give concrete shape to a new joint project that is planned to be launched in fiscal 2014 in cooperation with KISR and KNPC.

2. Progress of the Project

Meetings with KISR and KNPC have been held twice so far in Kuwait.

The first meeting was held last June to gather information about the present state and operational issues related to the hydrotreatment unit at KNPC, and to exchange views with KISR and KNPC about the possibility of engaging in joint research from fiscal 2014. The information obtained from the two-day meeting and the results of the joint research up to the last fiscal year were thereafter examined by JGC Catalysts and Chemicals Ltd. and Kyushu University, with the conclusion that emphasis should perhaps be placed on assessing the present status of issues related to the lifespan of catalysts for the hydrodesulfurization of LGO and AR produced from heavy Kuwait crude oil, and on examining solutions to those issues.

This conclusion was outlined in detail, and procedures



Meeting with KISR and KNPC



Hydrotreatment pilot plant
at JGC Catalysts and Chemicals Ltd.

for the assessment of present situations and problem solving were explained to KISR and KNPC in the second meeting held last November. At the beginning of the meeting, Dr. Meena Marafi, Executive Director of KISR's Process Research Center, thanked JCCP, saying that "the joint projects that have so far been implemented with JCCP have played extremely important roles in Kuwait, and have greatly contributed to strengthening ties between Kuwait and Japan," and thereby making it clear that the new project also occupies an important position in Kuwait.

Following Dr. Marafi's greeting, Mr. Isao Mochida, Professor at Kyushu University, explained the present state of issues concerning the life-span of hydrodesulfurization catalysts for LGO and AR produced from heavy Kuwait crude oil, and explained solutions to those issues. Also taking into consideration KISR's proposals, Prof. Mochida specifically noted that performing activity evaluations by a pilot plant that utilizes blended oil as feed oil and detailed structural analysis of raw oil and produced oil using the latest analysis instruments would be highly effective for understanding the behavior of asphaltene and resin contained in feed oil. He also explained that the introduction of GC/GCTOF/TOF (two-dimensional gas chromatography with time-of-flight mass spectrometer) to the analysis of LGO and AR could deepen molecular analysis, and thereby provide information that could lead to operational improvement and longer lifetime of the desulfurization unit at KNPC.

As there was general consent from the Kuwaiti side regarding the Japanese side's explanation of issues



Sample catalysts fabricated by JGC Catalysts and Chemicals Ltd.

and solutions based on an assessment of the present status, the two sides agreed to continue cooperating in implementing the project.

3. Future Plan

Based on the results of the research cooperation study, a new joint project is scheduled to begin in fiscal 2014, with a project agreement thereafter slated to be exchanged with KISR. As expressed by Dr. Marafi, it is hoped that by achieving its desired objectives, the project would contribute to strengthening ties between Kuwait and Japan.

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