KMUTT students take part in energy science internship (14 November-23 December 2016)

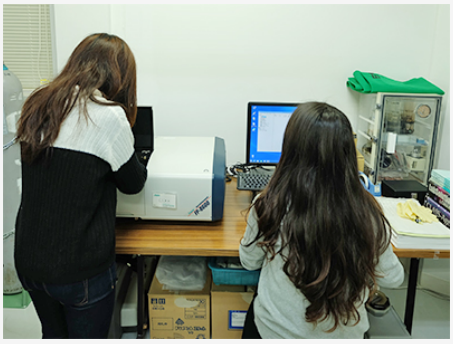
27 Jan 2017

From 14 November through 23 December 2016, in cooperation with the Graduate School of Energy Science, the Institute of Advanced Energy (IAE) held its fourth ASEAN Young Researcher Training Program in the Energy Field, with two students taking part from the Joint Graduate School of Energy and Environment (JGSEE), King Mongkut's University of Technology Thonburi (KMUTT), Thailand.

One of the students, Ms Nutsanun Klueb-arb, investigated reaction pathways in the photocatalytic conversion of sugars to high-value fuels and chemicals. She used commercially available titanium oxide powder (P25) to induce the photodegradation of arabinose, and observed, by means of high-performance liquid chromatography (HPLC), that this process yielded xylitol, gluconic acid, and formic acid. She also experimented with adding silver, copper, and palladium to titanium oxide to increase its catalytic activity, and analyzed the material's properties using scanning electron microscopy (SEM), photoluminescence measurement, photoelectron spectroscopy, and other methods.

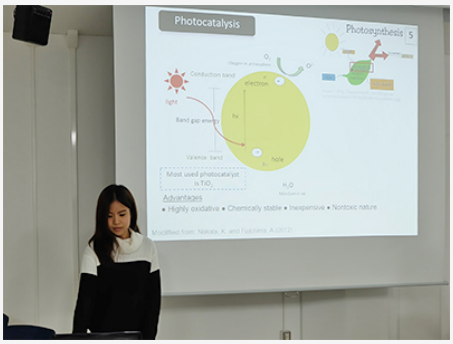
Ms Puangphen Hongdilokkul, the other student, studied the possibility of upgrading lignin to high-value products with the aid of a nanostructured photocatalyst. She explored several different conditions for calcining Ag-loaded P25, systematically performing surface elemental analysis based on SEM and energy-dispersive X-ray spectroscopy (EDX), measuring the powder's specific surface area and pore volume and size using the BET method, and drawing energy diagrams based on photoelectron spectroscopic analysis.

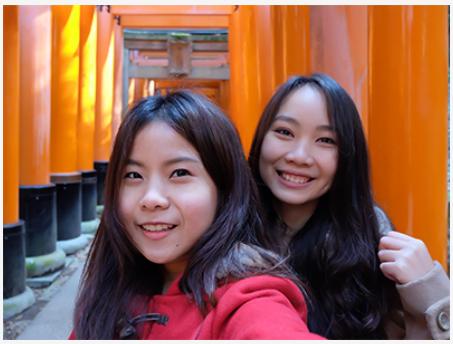
From the results obtained, she concluded that metal-loaded P25 -- if optimally designed in terms of porosity, specific surface area, and band-gap size, and calcined under appropriate atmospheric conditions -- could actually induce the photodegradation of lignin to produce high-value materials.



Working on photoluminescence measurement

Ms Puangphen Hongdilokkul measuring her sample's porosity and specific surface area





At the Grand Inari Shrine at Fushimi

Final presentation

With members of the host lab

Kyoto University
Yoshida-honmachi, Sakyo-ku, Kyoto 606-8501 JAPAN
Phone: +81-75-753-7531