

[Table III]

**Available Facilities and Contact Information**

| No. | Equipment<br>(Manufacturer/Model Name)   | Outline  |
|-----|--|--|
| 1   | X-Ray Photoelectron Spectrometer<br>(JEOL/JPC-9010MC)                          | An apparatus for analyzing the chemical composition and valence state of the surface of a solid material, comprising a sample pretreatment device and an argon ion etching device. It can be used for composition analysis of catalyst and photocatalyst.  |
| 2   | Transmission Electron Microscope<br>(JEOL/JEM-2100F)                           | High resolution field emission transmission electron microscope equipped with CCD monitor. Transmitted electron images and electron diffraction of samples can be measured.  |
| 3   | Multiwavelength Photoirradiation Apparatus                                     | A device capable of irradiating up to eleven samples simultaneously with high-intensity monochromatic light of different wavelength. Solution, suspension or thin film samples can be irradiated. Action spectra of photoreaction/photocatalytic reactions can be measured efficiently.  |
| 4   | High-precision field emission scanning electron microscope<br>(JEOL/JSM-7400F) | High resolution scanning electron microscope. Transmission electron measurement is possible in addition to standard measurements. EDX is also equipped. It is possible to observe the shape and chemical composition of solids, thin film samples. Vapor deposition equipment is also included. In addition, Low Vacuum Scanning Electron Microscope (JEOL/JSM-6360LA) belongs to this equipment and is available for measurement of hydrated samples under conditions close to actual conditions. It has EDX and element analysis is also possible. |
| 5   | Sorption (surface area and pore size) analyzer<br>(Yuasa Ionics/ Autosorb 6AG) | Simultaneous pretreatment and adsorption measurement of 6 samples are possible. By analyzing the nitrogen adsorption amount at the liquid nitrogen temperature, the specific surface area, pore distribution, etc. of the solid sample can be measured.  |
| 6   | Nuclear Magnetic Resonance Spectrometer I<br>(JEOL/ECX-400)                    | It is possible to identify the structure and observe dynamic behavior of molecules soluble in solvent. It is used for observation of catalytically active species and reaction intermediates of homogeneous catalysts etc. Both liquid and solid can be measured.  |
| 7   | Nuclear Magnetic Resonance Spectrometer II<br>(JEOL/ECX-400)                   | It is possible to identify the structure and observe dynamic behavior of molecules soluble in solvent. It is used for observation of catalytically active species and reaction intermediates of homogeneous catalysts.   |
| 8   | Nuclear Magnetic Resonance Spectrometer<br>(JEOL/ECX-600)                      | It is possible to identify the structure and observe dynamic behavior of molecules soluble in solvent. It is used for observation of catalytically active species and reaction intermediates of homogeneous catalysts.   |
| 9   | Computer System<br>(Software: Gaussian09, VASP)                                | A computer system that can perform theoretical calculations on the electronic state and structure of a molecule.   |

**Contact Information**

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