

Glove Box / BRAUN MB 150B-G



Glove box: This box is always filled with N_2 or Ar gas without moisture, which can be performed for the measurement and/or synthetic experiments of air- and/or moisture-sensitive compounds.

Glove Box / MIWA DBO-1KP-0

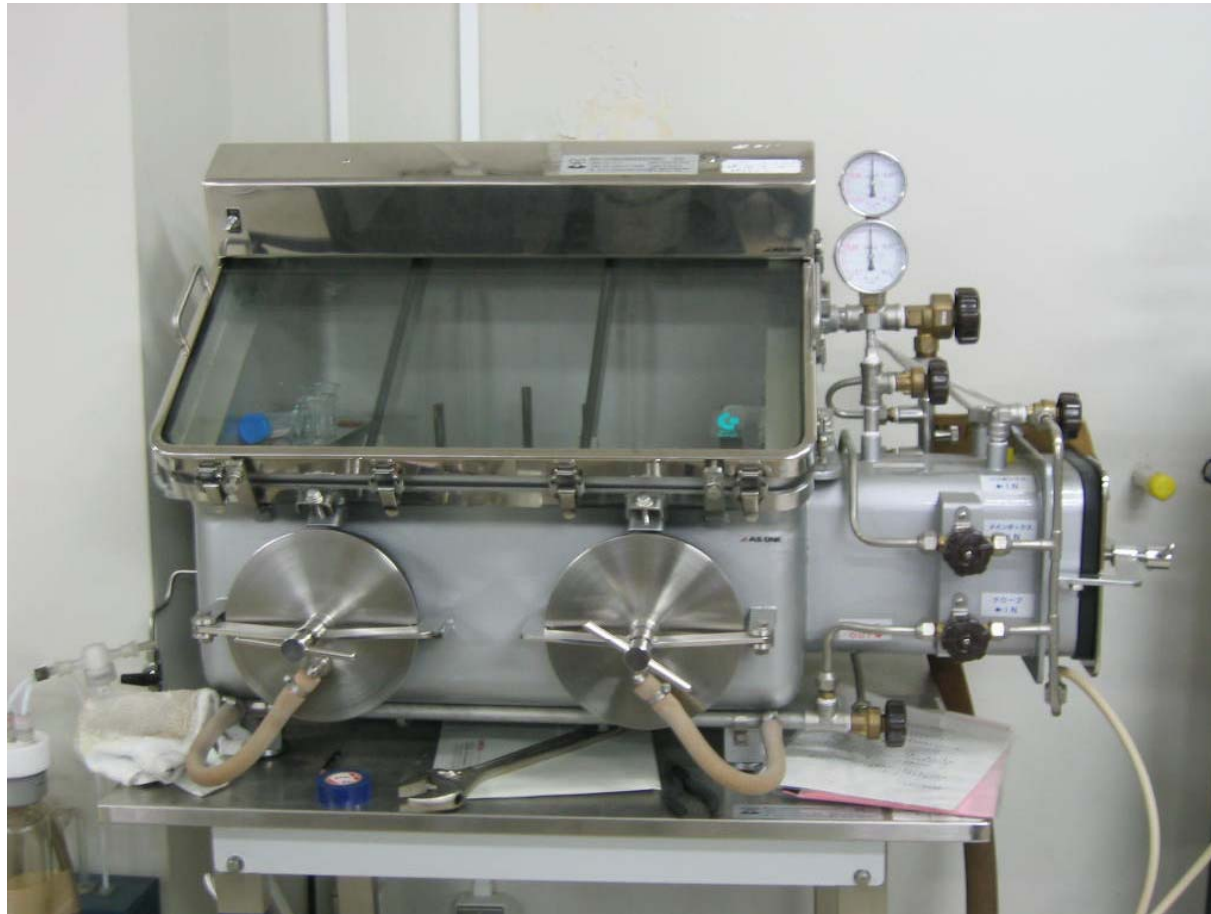


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Glove Box / MBRAUN UNILAB



Glove Box / AS ONE SGV-65V



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UV-vis and Diffuse Reflectance Spectrometer / JASCO V-570



UV-vis and reflectance spectrometer: This is electronic absorption spectrometer which provides the electronic structures of the samples in solution and solid states, respectively, even under a low-temperature.

UV-vis Spectrometer / JASCO V-530



UV-vis spectrometer: This is electronic absorption spectrometer which provides the information of electronic structures of the samples in solution state.

Mass Spectrometers / Micromass LCT



ESI-mass spectrometer: This is mass spectrometer to obtain the mass numbers of the samples and reaction products under a mild condition. Ionization method of the samples is electrospray ionization one.

Gas Chromatographs / Shimadzu GC 8A

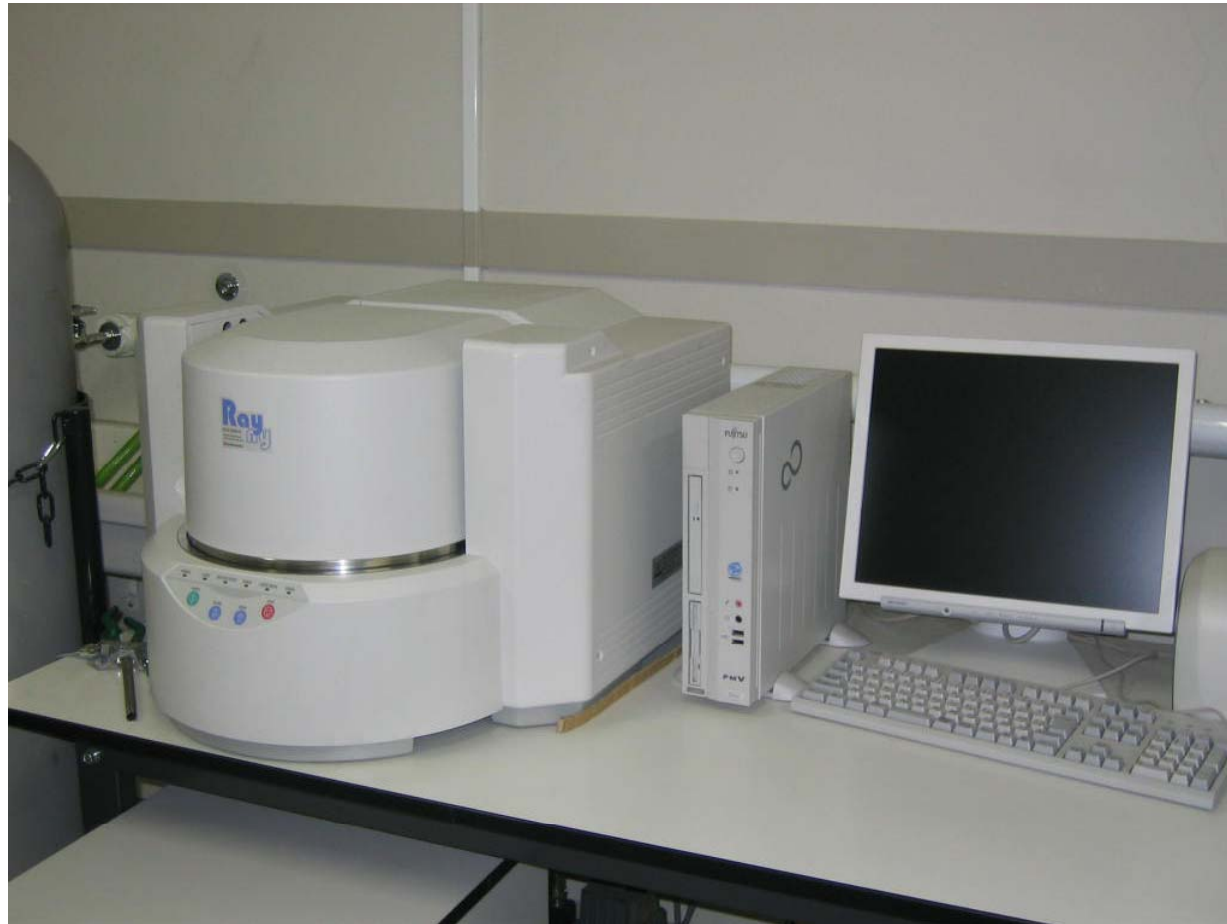


TCD

FID

Gas chromatography: Information of the reaction products and their amounts are given.

Energy Dispersive X-ray Fluorescence Spectrometer / Shimadzu EDX-800HS



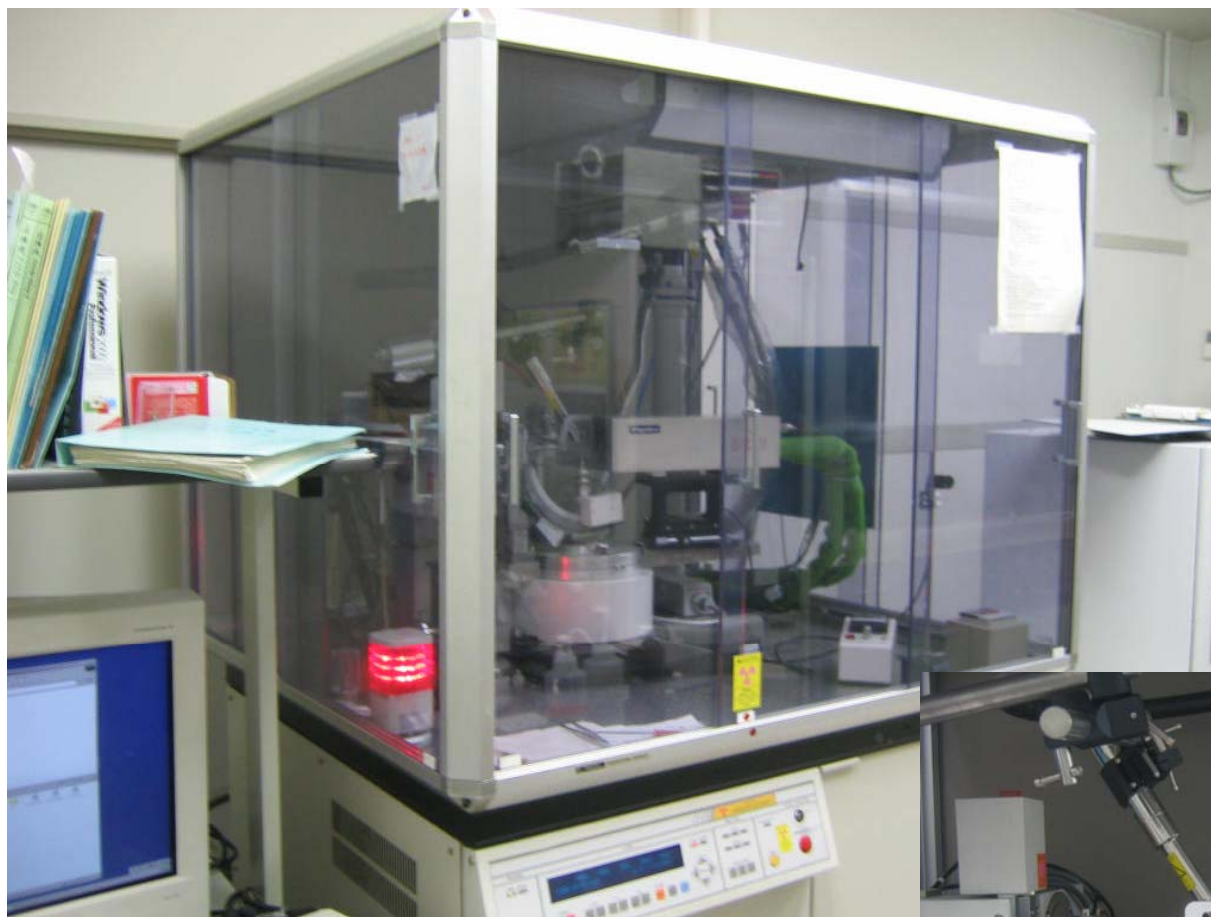
EDX: Information of the kinds of the elements (more than the mass of nitrogen) and their amounts are given.

Gas Chromatograph-Mass Spectrometer (GC/MS) / Shimadzu QP2010



GC/MS: This is gas chromatography equipped with mass spectrometer. The kinds of reaction products are evaluated from the mass numbers measured simultaneously.

Single Crystal X-ray Diffractometer / RIGAKU CCD MERCURY



Radiation: Mo K α

Single crystal X-ray diffractometer: The molecular structures of the compounds in the crystalline state are given at a low temperature.



Single Crystal X-ray Diffractometer / RIGAKU



Radiation: Cu K α

Single crystal X-ray diffractometer: The molecular structures of the compounds in the crystalline state are given at a low temperature.

FT-IR ATR Spectrometer / JASCO FTIR-410



FT-IR spectrometer: The information of molecular vibrations is obtained from absorption of infrared radiation, which is quickly obtained even in trace amounts of the samples by Fourier transformation method.

ESR spectrometer / JEOL JES-RE1X



ESR spectrometer: This provides the electronic state and structure of the organic radical compounds and transition metal complexes with unpaired electron.



Cyclic Voltammetry equipped with QCM / HZ-5000



CV/QCM: This is cyclic voltammetry equipped with QCM (quartz crystal microbalance), by which the redox potentials of metal complexes and the mass change of the samples are provided simultaneously.

Cyclic Voltammetry / CV-50W



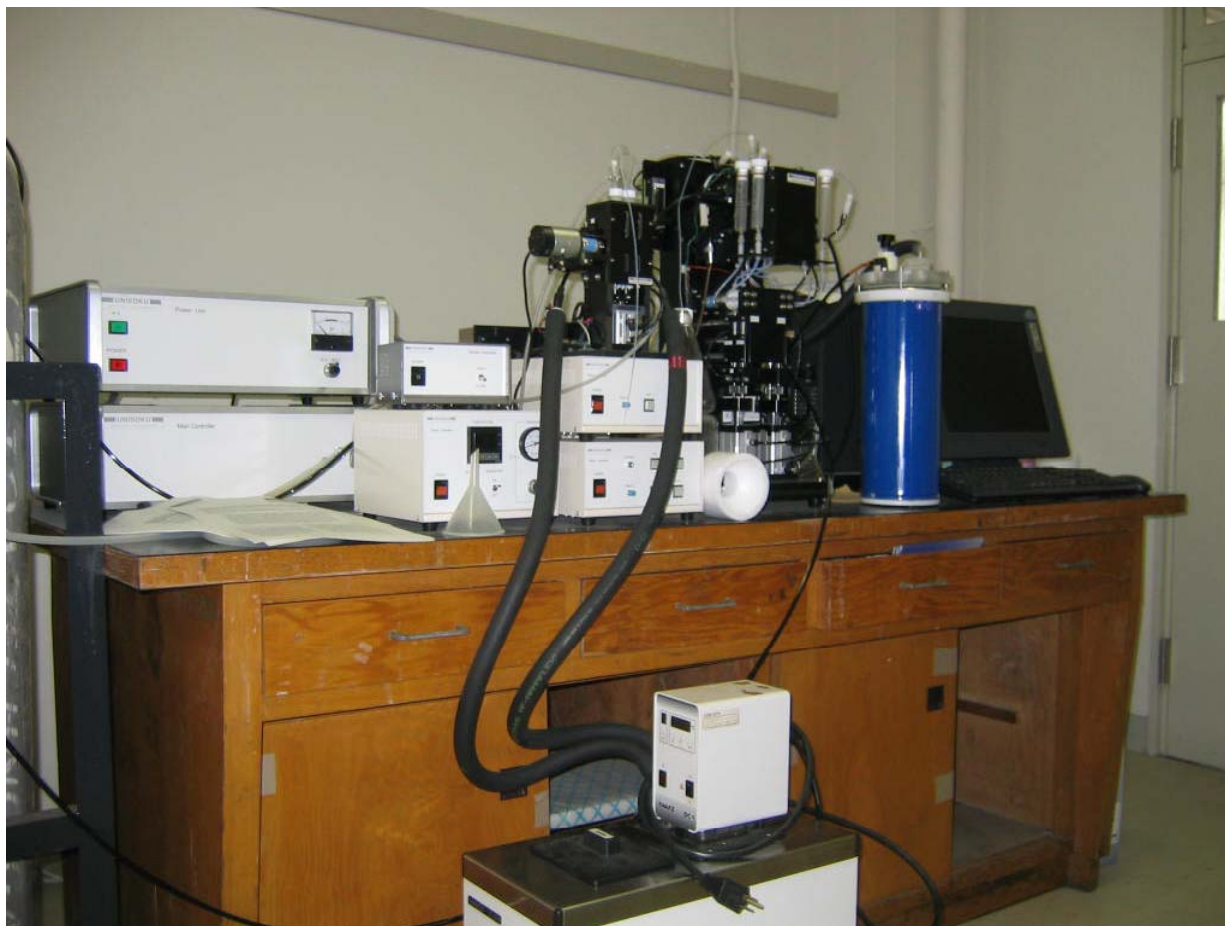
CV: This provides the redox (reduction/oxidation) potential values of the metal complexes.

In situ Absorption Spectroscopy / TRS-10



In situ absorption spectrometer: This provides *in situ* and continuous observations of absorption spectra of the chemical reaction in solution.

Low-temperature Stopped-flow Spectroscopy/ UNISOKU



Stopped-flow spectrometer: This provides the kinetic data from the reaction rates between two compounds at low temperature.

Centrifuge / TOMY MX-160 Autoclave / TOMY BS-235



Centrifuge

Autoclave

Stopped-flow spectrometer: This provides the kinetic data from the reaction rates between two compounds at low temperature.

Scanning Probe Microscope / Shimadzu SPM-9600



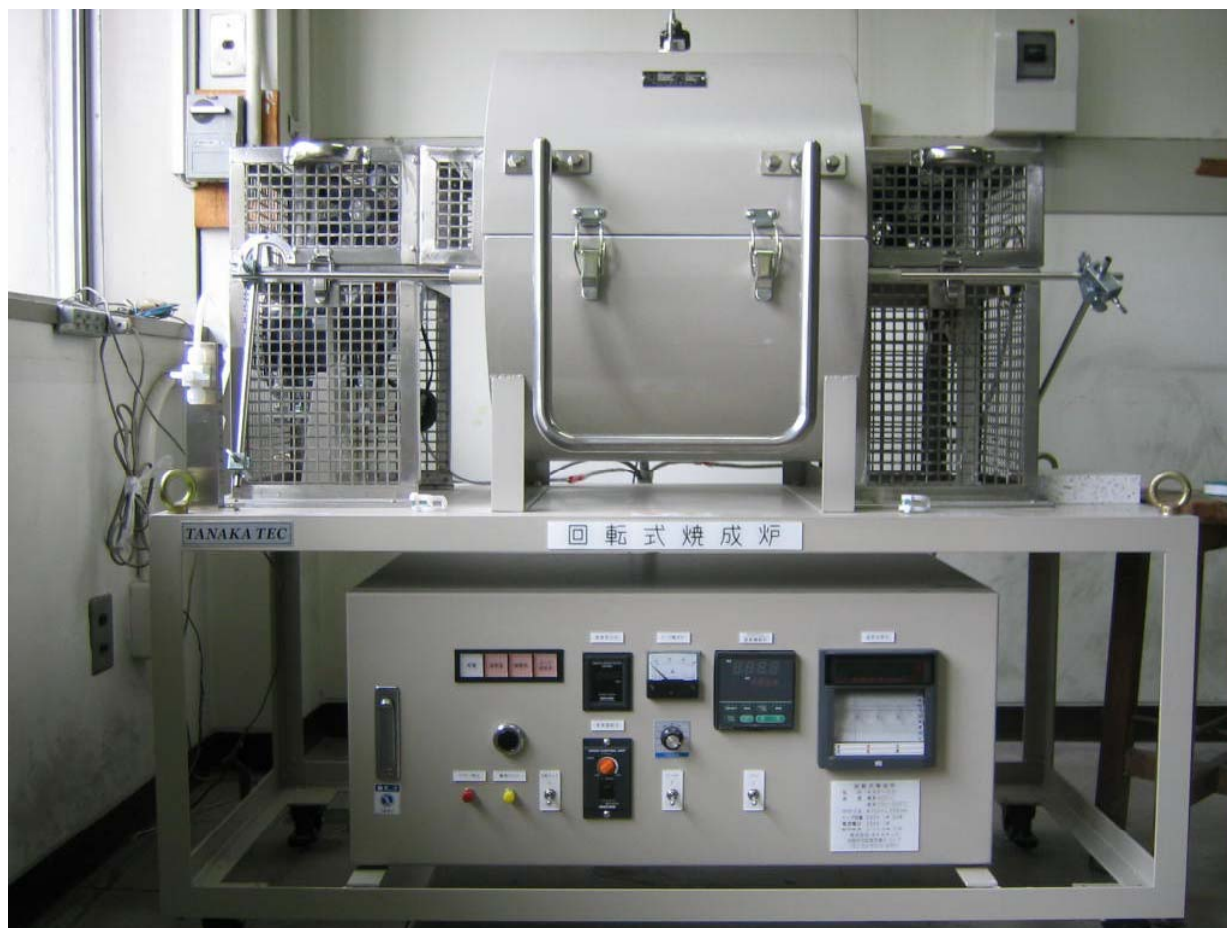
Scanning probe microscope: This is so-called AFM (atomic force microscope), which gives the image and size of the materials in nano meter level.

PERKIN ELMER CHNS/O Analyzer 2400



Elemental analysis: This provides the mass (weight %) of compounds containing CHNS.

Rotary Kiln (Synthesis of Phthalocyanine-Zeolite by Ship-in-bottle Method)



Rotary kiln: This is rotary kiln to synthesize the phthalocyanine encapsulated in zeolite by the 'Ship-in-bottle' method, by which we can obtain the reaction product at 200 g per a day.

Rectifying Column / EYELA Still Ace SA2100E



Rectifying column: This is the column to rectify the sample.

Fume hood



Fume hood: This is small experimental box to carry out the operations involving the fumes or bad odors, which must be conducted under this hood.

Refrigerator / SANYO LABO COOL



Refrigerator
(biological treatment):
This is the cooling
room (at 4 ° C) where
bio-materials such as
bacteria and cells are
treated.

Computer System for X-ray Structure Analysis



Computer system for X-ray structure analysis: This is computer system for X-ray structure analysis. Using the system, we can determine the molecular structures of the single crystals.

XAFS Spectroscopy / Rigaku Looper



XAFS (Extended X-ray absorption fine structure): This provides the structural information around heavy atoms in the solid state compounds, which is on the basis of the property of X-ray absorption by heavy atoms.

High vacuum vapor evaporator chamber / Shinku JIS-300AK



High vacuum vapor evaporator chamber:
This is the vapor evaporator to prepare the gold electrode vaporized on the substrate.

HPLC / JASCO UV-2075 plus, PU-2085 plus



HPLC: This is a high performance liquid chromatography, which isolates the reaction products and evaluates their amounts.

HPLC / Shimadzu Prominence Series



Fluorescence Lifetime Spectrometers / Photal PTI-5100S



Fluorescence lifetime spectrometer: This provides the emission spectra of fluorescent compounds and their life-times.

Low Temp. Pairstirrer /EYELA PSL-1800



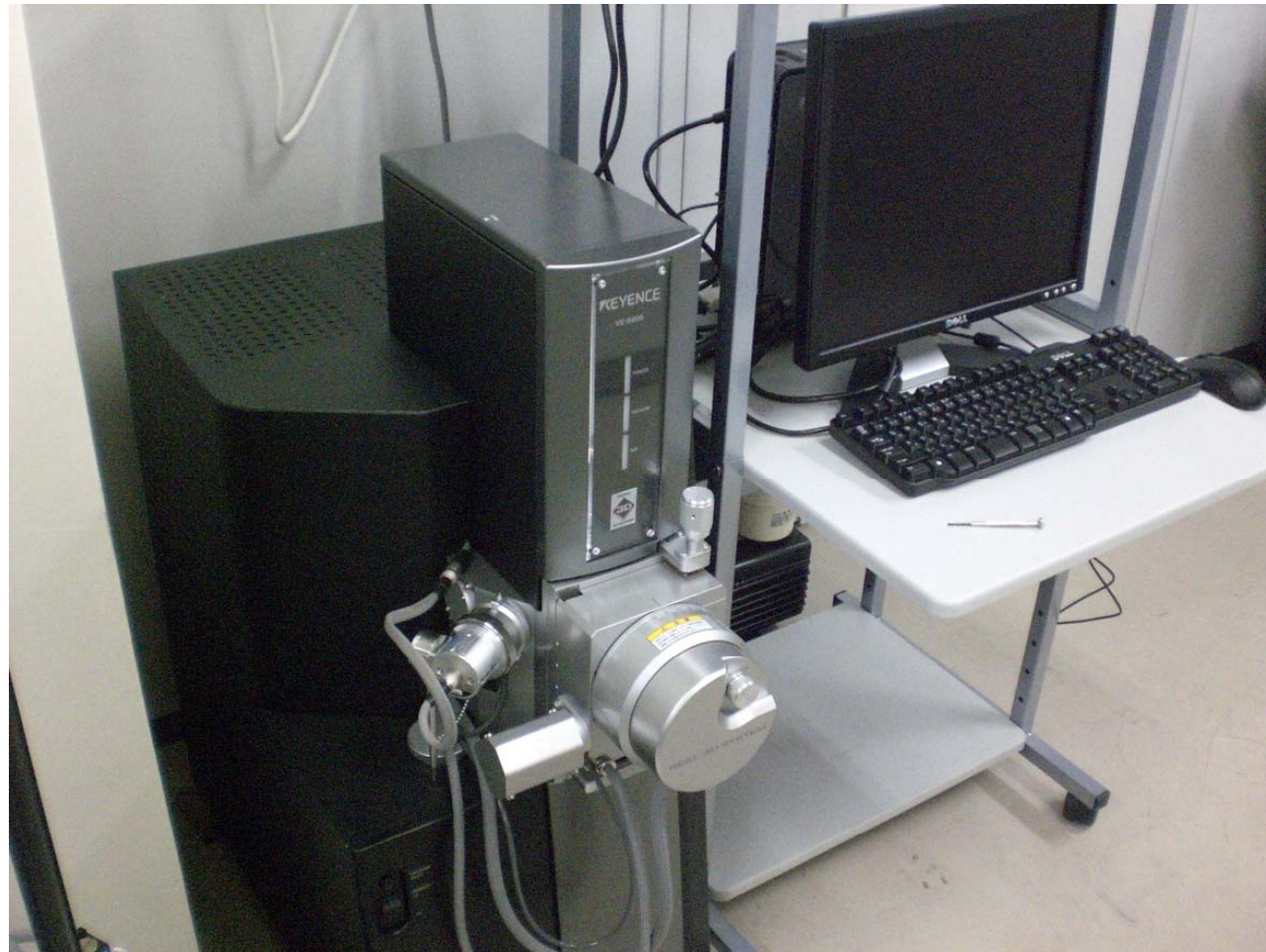
Lo temp. pairstirrer: This is the vessel to carry out the reaction at low temperature.

Resonance Raman Spectroscopy / JASCO

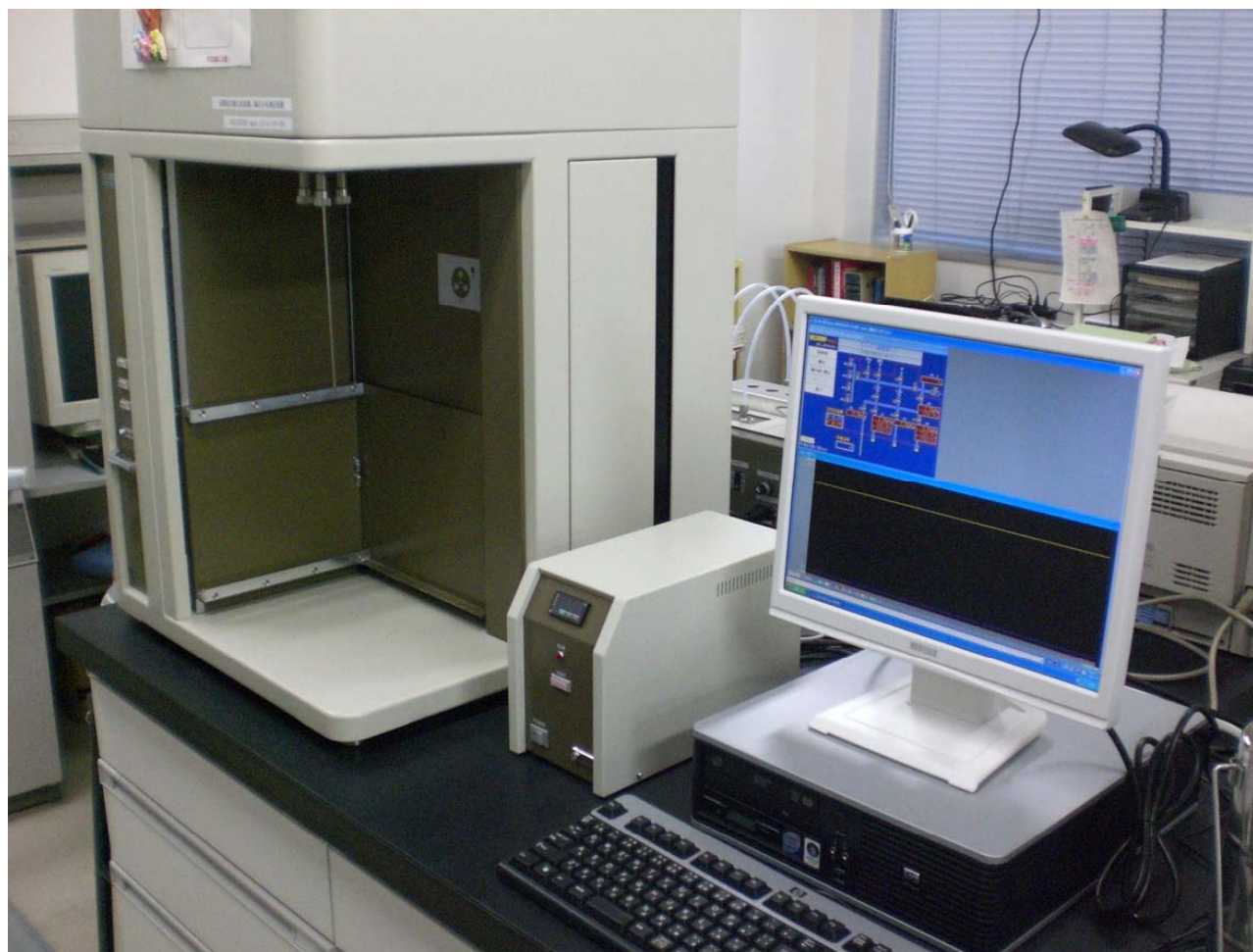


This is a resonance Raman spectroscopy with an excitation of 532 nm, which is equipped with a low-temperature apparatus.

Scanning Electron Microscopy / KEYENCE VE-9800



High Performance Gas and Vapor Adsorption Instrument / BEL BELSORP-max



Calcination Kiln / AS ONE TMF-300N



Micro-reactor System / mikroglas mikroSyn

