Contents

1.Introduction

Material Analysis Center (MAC), the predecessor of Comprehensive Analysis Center (CAC), had been established in 1977 as an affiliated facility of The Institute of Scientific and Industrial Research (ISIR). CAC, with the reorganization of MAC integrating the former Electron Microscope Room, was established in 2009 as a common comprehensive facility to support a wide range of basic and applied research fields in ISIR. CAC staffs consist of 1 associate and 2 assistant professors (as full-time professors), 6 technical staffs, 1 part-time staffs, 3 associate professors (concurrent post), 2 assistant professors (concurrent post) and 1 director (concurrent post).

Fortunately, immediately after the renewal, CAC could update many of decrepit instruments to globally advanced instruments by obtaining a supplementary budget in 2010 to be equipped with observation instruments including component and surface analyzers, spectrometers and electron microscopes, shown in this booklet, to comprehend various research fields in ISIR. The instruments are maintained and managed by CAC staffs to allow users to utilize at any time. CAC staffs support analyses by utilizing instruments required expertise and each researcher can utilize easily operable instruments all day. Lectures for instrument users, including instrumental analysis lectures for new students, is vigorously held every year. Fully utilize the instruments in CAC if you read this booklet and/or CAC users' guide.

CAC is an ISIR-affiliated common facility and primarily positioned as a research support facility in ISIR. Additionally, CAC enhances cooperation with collaborative research facility networks centering on Center for Scientific Instrument Renovation and Manufacturing Support, Osaka University. CAC users consisting of intramural and extramural researchers and Incubation Building-located company workers are currently increasing. CAC was highly evaluated by external evaluations held in 2012 as "an open facility which is a model case in Japan and Osaka University should be proud of".

All CAC staffs make further efforts to effectively utilize the expenditure to allow all users to give excellent research results. The CAC full-time professors conduct their original research related to organic, organometallic and analytical chemistry by fully utilizing instruments in CAC. Additionally, CAC staffs vigorously participate in opening CAC to the public (Icho Festival), tours for high school students and introduction activity of advanced instruments and research.

CAC staffs would appreciate the understanding and cooperation of all users' for maintenance and development.

2.Staff List

Position	Name	Affilation	Extension	E-mail *1)	Room No Annex of Research Buildings
Director	Akira Oiwa	Department of Quantum System Electronics	8405	oiwa	N209
Associate Prof.	Takeyuki Suzuki	Comprehensive Analysis Center (CAC)	8525	suzuki-t	205-1
Assistant Prof.	Dayang Zhou	Comprehensive Analysis Center (CAC)	8526	zhou	206
Assistant Prof.	Kaori Asano	Comprehensive Analysis Center (CAC)	8527	asano	206
Associate Prof.	Mitsuko Nishino	Department of Biomolecular Science and Regulation	8548	mnishino	F341
Associate Prof.	Tomoyo Goto	Department of Advanced Hard Materials	8436	goto	S605
Assistant Prof.	Yasunobu yamashita	Department of Complex Molecular Chemistry	8471	yyamashita	F527
Assistant Prof.	Seihou Jinnai	Department of Soft Nanomaterials	8476	jinnai	F506
project researcher	Ming-Chun Hsieh	Comprehensive Analysis Center (CAC)	4295	hsieh	S115
Staff	Tsuyoshi Matsuzaki	Technical Division	8527	matuzaki	302
Staff	Hitoshi Haneoka	Technical Division	8526	haneoka	206
Staff	Yosuke Murakami	Technical Division	8531	murakami	S105
Staff	Tsunayoshi Takehara	Technical Division	8528	takehara	206
Staff	Takuya Yamanaka	Technical Division	6510	t-yamanaka	S506
Staff	Nao Eguchi	Center for Scientific Instrument Renovation	4782	eguchi-n *2)	I405
Assistant Administrative Staff	Satoko Wada	Comprehensive Analysis Center (CAC)	8529	cac-secretary	201

*1) @sanken.osaka-u.ac.jp *2) @office.osaka-u.ac.jp


A.Oiwa


T. Suzuki


D. Zhou


K. Asano


S. Wada


M.Nishino


T. Goto


Y.Yamashita


S.Jinnai


T. Matsuzaki


H. Haneoka


Y. Murakami


T. Takehara


T. Ymanaka


N. Eguchi


M-C. Hsieh

3.Instrument List

Instrument Name	Model (Maker) Name	Measurement Method		For Self Measurement			Installation Room *2)	Details	Staff
		Request	Self	Special Guidance	Reservation	Overtime Utilization *1)			
Nuclear Magnetic Resonance 700 MHz	Avance Ⅲ-700 (BRUKER)	○			Available	Available	105	5	D. Zhou H. Haneoka
Nuclear Magnetic Resonance 600 MHz	Avance Ⅲ-600 (BRUKER)	○					104	5	
Nuclear Magnetic Resonance 600 MHz	ECA-600 (JEOL)	○	○	Required			106	6	
Nuclear Magnetic Resonance 400 MHz	ECS-400(JEOL)		○	Required			F428	6	Y.Yamashita
Nuclear Magnetic Resonance 400 MHz	ECS-400(JEOL)		○	Required			F507	6	S. Jinnai
Mass Spectrometer	JMS-700(JEOL)		○	Required	Available	Available	303	7	K. Asano T. Matsuzaki
	AccuTOF-DART(JEOL)		○	Required	Available	Available	303	7	
	Ultraflex Ⅲ (BRUKER)		○	Required	Available	Available	304	8	
	micrOTOF Ⅱ (BRUKER)	Negotiable					304	8	
	LTQ Orbitrap XL(THERMO)	○					304	9	
	ITQ1100(THERMO)		○	Required	Available	Available	304	9	
Secondary Ion Mass Spectrometer	M6(IONTOF)		○	Required	Available	Available	102	10	N. Eguchi
Infrared Spectrophotometer	FT/IR4100(JASCO)		○	Required	Available	Available	302	10	T. Suzuki H. Haneoka
	React-IR45 (METTLER)	Negotiable	○		Available	Available	302	11	
Ultraviolet-visible Spectrophotometer	V-770(JASCO)		○	Required	Available	Available	302	11	
Polarimeter	P-2300(JASCO)		○	Required	Available	Available	302	12	
Circular Dichroism spectrometer	J-1500(JASCO)		○	Required	Available	Available	302	12	
Inductively Coupled Plasma Spectrometer	ICPS-8100(SHIMADZU)		○	Required	Available	Available	301	13	N. Eguch H. Haneoka
CHN Element Analyzer	2400(PERKIN-ELMER)	○					302	13	T. Matsuzaki
	JM10(J-SCIENCS)	○					302	14	
Differential Thermal Balance	TG8120(RIGAKU)		○	Required	Available	Available	302	14	T. Takehara
Differential Scanning Calorimeter	DSC8270(RIGAKU)		○	Required	Available	Available	302	14	

Instrument Name	Model (Maker) Name	Measurement Method		For Self Measurement			Installation Room *2)	Details	Staff
		Request	Self	Special Guidance	Reservation	Overtime Utilization *1)			
X-ray Microanalyzer	JXA-8800R(JEOL)	○	○	Required	Available	Available	102	15	N. Eguch
Scanning Electron Microscope	JSM-F100(JEOL)	○	○	Required	Available	Available	S107	15	Y. Murakami N. Eguch
Transmission Electron Microscope	JEM-ARM200F(JEOL)	○					S104	16	M.Nishino H. Yoshida Y. Murakami
	JEM-2100(JEOL)	○	○	Required	Available	Available	F192	16	
focused ion beam	FB-2100(JEOL)		○		Available		S113	—	Y. Murakami
Nanoscale Hybrid Microscope	VN-8010(Keyence)		○	Required	Available	Available	S107	—	
X-ray Photoelectron Spectroscopy	JPS-9010(JEOL)		○	Required	Available	Available	101	17	H. Haneoka
X-ray Diffractometer	SmartLab(RIGAKU)	*3) ○	○	Required	Available	Available	101	17	T. Takehara
X-ray fluorescence	ZSX100e(RIGAKU)		○	Required	Available	Available	101	18	T. Goto
X-ray Diffractometer for Single Crystals	XtaLAB PRO(RIGAKU)	○	○	Required	Available	Available	203	18	T. Takehara

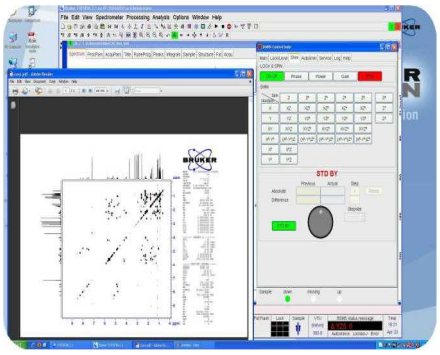
*1) “Overtime Utilization” means utilization of CAC expect 8:30-18:00 on weekdays.
(See p.21 for details)

*2) See Floor Map (p.29)

*3) We only accept particular maesurements.

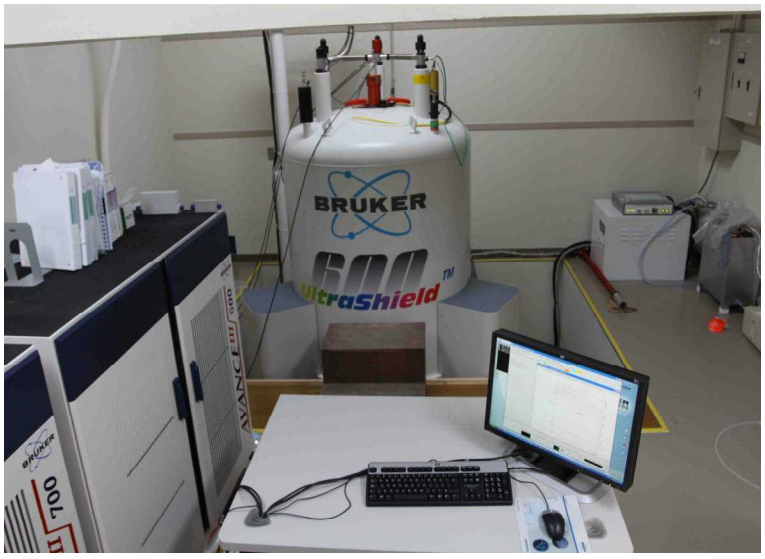
4.Summary of Instruments

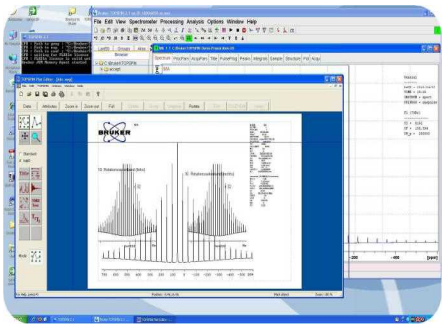
Nuclear Magnetic Resonance 700MHzNMR



AVANCE III 700, NMR spectrometer of Bruker BioSpin, is an advanced digital NMR device at the high level. Combination of cryoprobes enables supersensitive NMR measurement. The spectrometer has supersensitive triple resonance probes for ^{1}H, ^{13}C and ^{15}N, which optimizes ^{1}H and ^{13}C nuclear measurements, enables high sensitive and rapid 2D and 3D measurements, and remarkably shortens measurement time. The spectrometer has automatic tuning/matching functions and enables fully automatic measurement with rapid and high resolution by simultaneously using sample changers, which is applicable to the various fields including pharmaceutics, biotechnology, chemistry, material science etc.

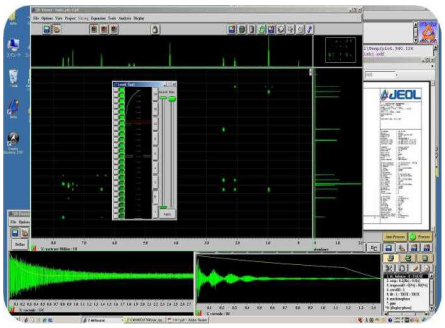
Nuclear Magnetic Resonance 600MHzNMR(solid)





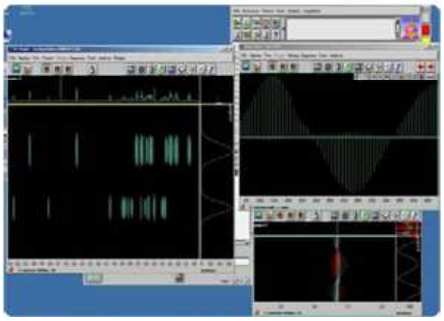
AVANCE III 600WB, solid NMR spectrometer of Bruker BioSpin, has a wide bore magnet, which enables measurement at -140 ~ +150°C. Combination of 4mm CPMAS probes and superhigh speed rotary 1.3mm CPMAS probes enables proton, multinuclear and 2D NMR measurements difficult for conventional spectrometers. The solid NMR spectrometer at the high level is applicable to the various fields including material science, life science and determination of solid catalysts.

Nuclear Magnetic Resonance 600MHzNMR



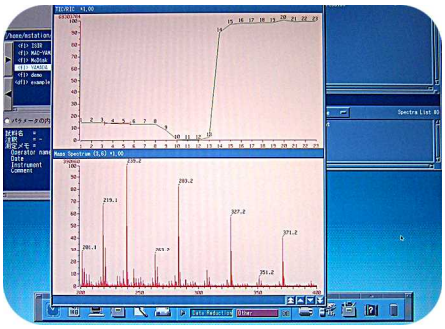
JNM-ECA 600 (JEOL), is an FT-NMR spectrometer using the advance digital technology and high frequency. Automatic tuning and matching enables gradient shim. The spectrometer easily provides NMR spectra with high reproducibility and quality. The water signal elimination and differential spectrum measurements are also easily measurable. Low frequency probes are also equipped. The spectrometer is applicable to rhodium element and has an MICCS instrument enabling reaction tracing measurement.

Nuclear Magnetic Resonance Spectrometer 400MHzNMR



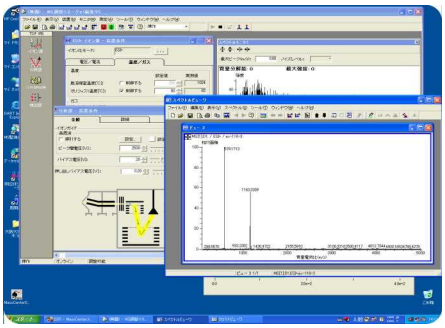
Two high performance magnetic resonance spectrometers (JNM-ECS 400), have the spectrometer originally equipped with auto-tuning probes which enable to cleanly, quickly and easily measure various NMR spectra. The spectrometers are equipped with data processing software Delta which enables to easily and freely process data. Users also can process NMR data by using analytical software such as Delta, Net Alice etc. through theirs PC in the ISIR.

Mass Spectrometer FAB-MS (JMS-700)



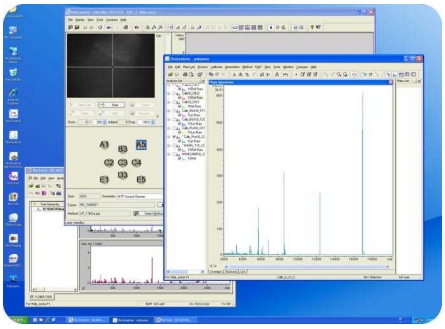
This JMS-700, developed by JEOL, is the reverse geometry (BE geometry) double-focusing mass spectrometer of the magnetic field preceding type by which the ion optics system consists of a magnetic field and an electric field. That's the successor model of forward geometry (EB geometry) analyzer JMS-600H, and that can tune parameters about condition automatically. Chemical composition can be presumed because of its good-sensitivity and high resolution.

Mass Spectrometer DART-MS



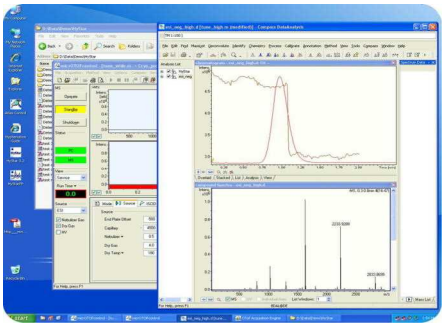
This mass spectrometer has a dedicated DART (Direct Analysis in Real Time) ion source attached to a high-resolution time-of-flight mass spectrometer. The DART ion source is a novel ion source and applicable to samples under atmospheric pressure and at ground potential, which enables contactless and rapid analysis. The spectrometer is applicable to gases, liquids and solids. Instantaneous measurability of samples without any pre-treatments of the surface of the samples is characteristic of the spectrometer. The spectrometer is effective for screening and high-throughput analysis.

Mass Spectrometer MALDI-MS



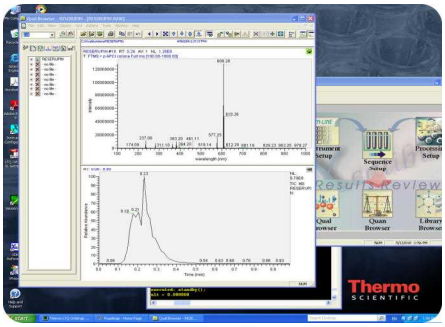
Ultraflex III, developed by BRUKER, has smartbeam as a laser beam to largely enhance sensitivity and resolution. The focal point size (10μm~80μm) of the laser is controllable by PC. Applying minimal laser focuses to samples enables to scan sample regions with very high pixel resolution, very high sensitivity and very high resolution by MARDI imaging experimental instrument. The spectrometer exhibits a wide mass range of 1 - 500,000 and high resolution of 25,000 by using PAN (Panoramic) technology.

Mass Spectrometer CSI-MS



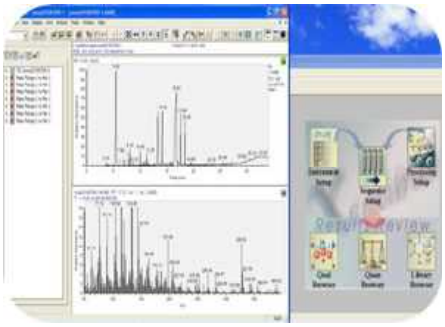
This spectrometer has a cryogenic ion source (CryoSpray) with micrOTOF II (mass accuracy: 1-2 ppm, mass resolution: 16,500 and measurable mass range: 50~20,000 m/z), which enables CryoSpray-TOF-MS measurement and measurement under cooled ionization conditions. The spectrometer is suitable for samples with unstable at room temperature: organometallic complexes, supramolecular complexes and reactive intermediates etc.

Mass Spectrometer FT-MS



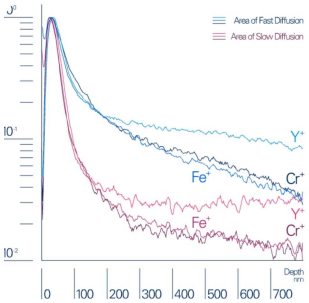
This hybrid electric field Fourier-transform mass spectrometer (FT-MS) has Orbitrap and high speed and high sensitive LTQ XL equipped with linear ion trap. The spectrometer has high performances with high resolution (100,000 of resolution) and accuracy (3 ppm), which enables not only structural analysis of low molecules but also identification of complicated proteins by multistep MS/MS. Accelerating scanning speed and shortening a cycle time enable a very short measurement time of a few to 5 minutes per sample. ESI, APCI and APPI ionizations are selectable and a wide range of samples is measurable at the highest level.

Mass Spectrometer GC-MS



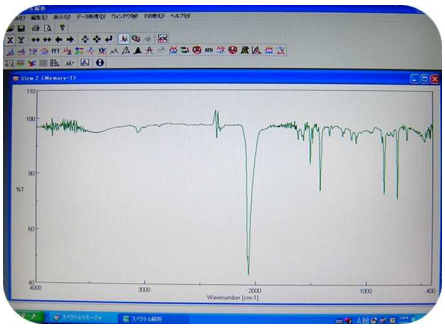
A member of the Thermo Fisher Scientific ITQ™ Series of GC-ion trap mass spectrometers, the ITQ 1100™ GC/MS^n (measurable mass range: 10-1100 m/z) enables MS^n (MS/MS, $n \leq 5$). The ITQ 1100 has new advanced scan-function of "ACE (Automated Collision Energy) and PQD (Pulsed Q Dissociation Mode)". The advantages of its functions are easier to optimize analysis and data quality is improved. It acquires full scan and MS^n data in a single acquisition simultaneously. ITQ 1100 restores the performance without venting by using the standard vacuum probe interlock.

Time of flight secondary ion mass spectrometer TOF-SIMS



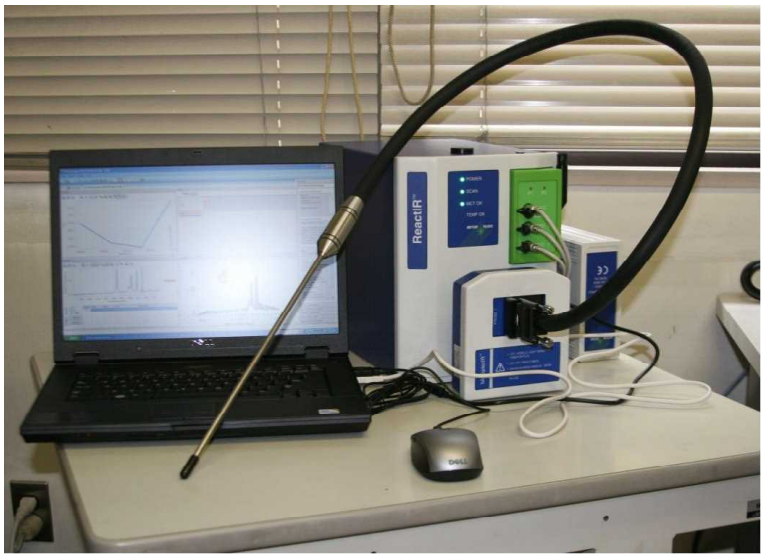
TOF-SIMS irradiates the sample surface with an accelerated ion beam and detects the generated secondary ions with a time-of-flight mass spectrometer. Unlike dynamic SIMS, TOF-SIMS can perform surface analysis using pulsed ions. Since this device is equipped with a spatter gun, it is possible to perform depth direction analysis while spattering materials. It is possible to obtain MS spectra and depth profiles for all elements and molecules. In addition, since it has excellent spatial resolution compared to other surface analysis, it is possible to analyze minute areas and perform MS imaging.

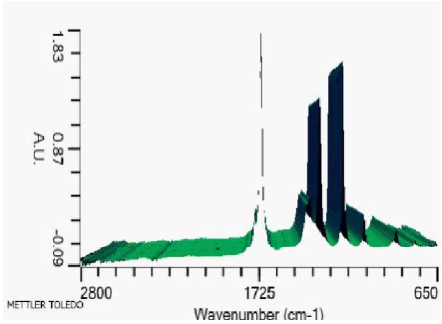
Fourier Transformation Infrared Spectrophotometer FT-IR



This compact infrared spectrophotometer Fourier-transforms interference waves by PC, which has high sensitivity, stability and easy operability and is suitable for routine analysis. The spectrophotometer has ATR (Attenuated Total Reflection) measuring instrument, which is applicable to film and powder samples. The spectrophotometer enables middle, near and far infrared measurements, which afford infrared absorption spectra from a wide range of both inorganic and organic samples. Furthermore, the spectrophotometer is applicable to rapid scanning and imaging measurements, which enables to utilize for research and material development.

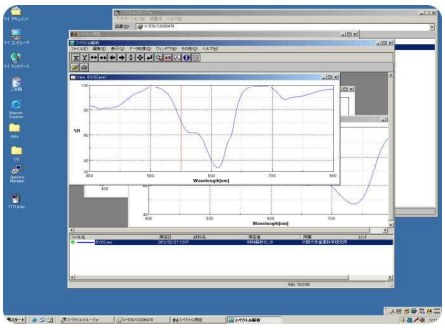
Infrared Spectrometer React IR





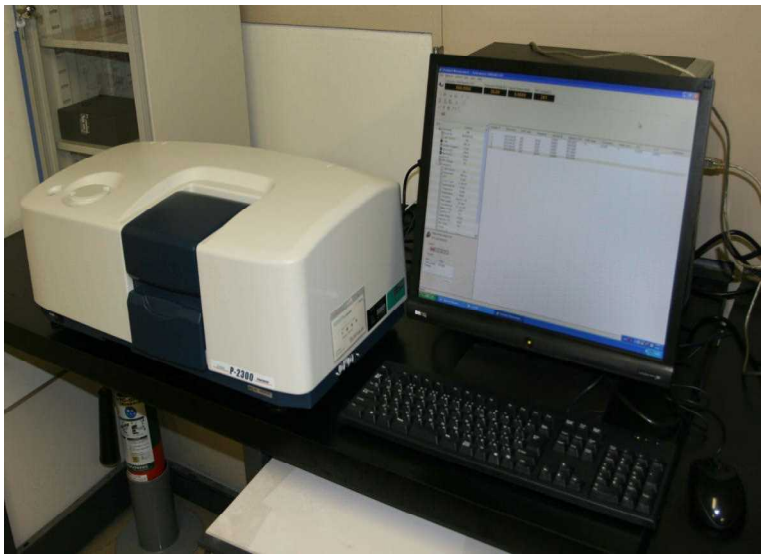
This spectrometer enables continuous measurement for the shortest time of every 5 seconds, which continuously monitor various changes in a solution by showing infrared spectra. The spectrometer is effective for analysis of reaction mechanisms due to identifiability of reaction intermediates existing only during chemical reactions and observability of the extinction rate of starting materials and the formation rate of products from changes of peak intensities.

Ultraviolet-visible Near Infrared Spectrophotometer UV・Vis・NIR



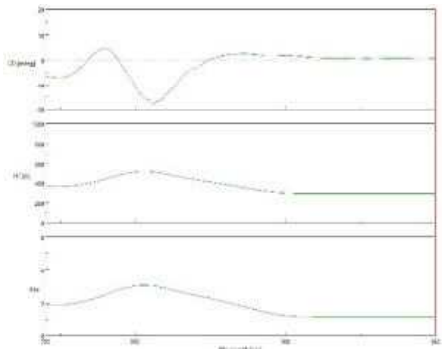
This spectrophotometer enables continuous measurements between ultraviolet and near infrared regions. The spectrophotometer has automatically switchable detectors by measurement wavelengths: a photomultiplier tube for the ultraviolet and visible regions, and a PbS detector for the near infrared region. Using an integrating sphere enables diffuse reflection measurement of solid surfaces and diffuse transmission measurement of suspension. Most of incident light to the sample, reflected and/or transmitted in all directions, is acquired by the integrating sphere, which enables accurate measurement.

Polarimeter P-2300



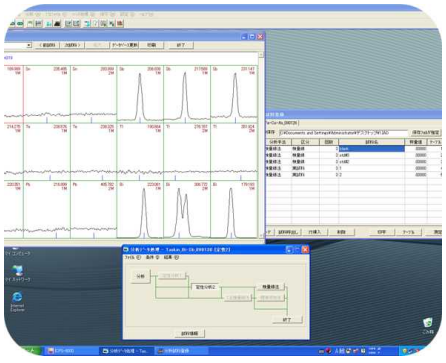
This polarimeter has both sodium and mercury lamps and a Glan-Taylor prism as a polarizer. The measurement wavelength is selectable from 589, 578, 546, 436 and 365 nm. The polarimeter has various types of cells, which enables to measure samples of at least 100 µl. Highly accurate measurement under temperature control by using an air-cooling Peltier cell is also performable.

Circular Dichroism spectrometer J-1500 CD



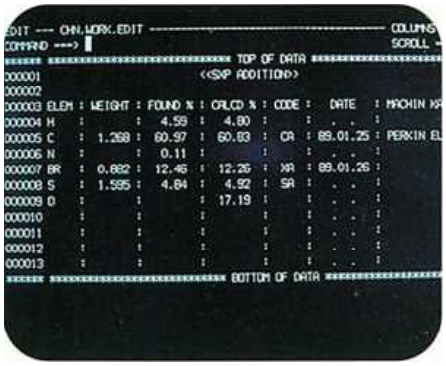
CD (Circular Dichroism) spectrometer is suitable not only in the ultraviolet and visible regions, but also wide range of measurement wavelength from vacuum ultraviolet to near infrared (163~1600nm) which cover the chiral polymer, supramolecule, proteins and nucleic acids chemistry. Moreover, the CD measurement at the solid state is available with powder CD measurement unit.

Inductively Coupled Plasma Spectrometer ICP



This top-class ICP emission spectrometer has 2 sequential scanning spectrometers, which exhibits both high resolution and high speed. Plasma energy from the spectrometer excites component elements in samples. The spectrometer measures emission rays of the excited elements transiting to the lower energy levels. The spectrometer enables a wide range of highly accurate analyses including ppb-level analysis of trace elements in a solution and high concentration analysis such as composition analysis. Rapid simultaneous quantitative analysis of multiple elements is also performable.

Organic Trace Element Analyzer CHN

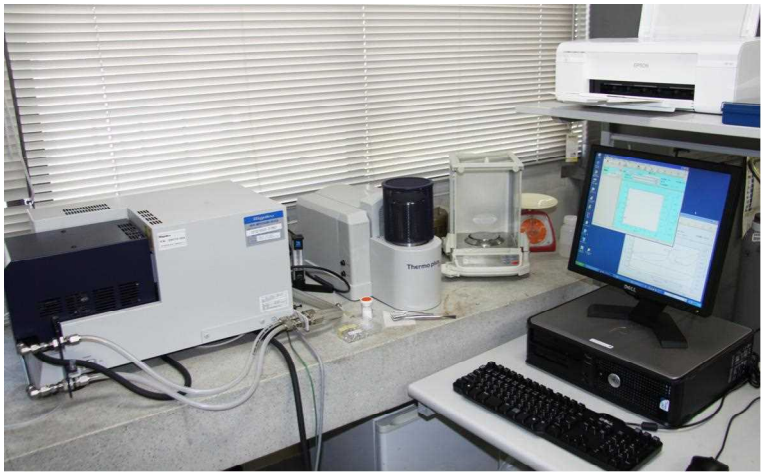


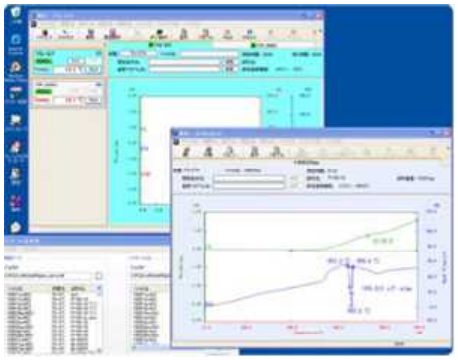
Elemental analysis is a classical and important quantitative analysis and purity test, which determines a weight percentage of elements composing pure samples including organic compounds by combustive and oxidative decomposing the pure samples. The analysis is mainly applied to confirmation of synthetic chemicals and determination of the structure of natural compounds. Stable and highly pure samples afford highly accurately analytical values. Measurable elements are carbon, hydrogen and nitrogen.

Element Analyzer EA

Elemental analysis is a classical and important quantitative analysis and purity test, which determines a weight percentage of elements composing pure samples including organic compounds by combustive and oxidative decomposing the pure samples. The analysis is mainly applied to confirmation of synthetic chemicals. Measurable elements are carbon, hydrogen and nitrogen. Ash content is also quantifiable.

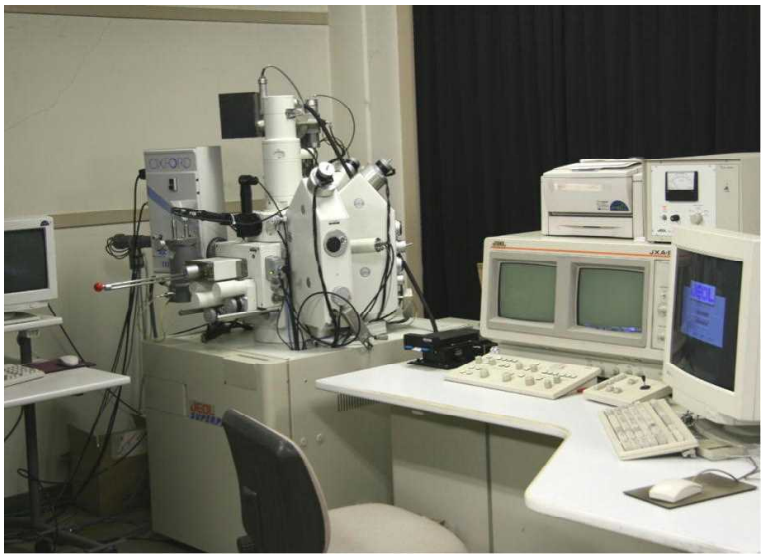
Thermal Analyzer TG8120, DSC8270





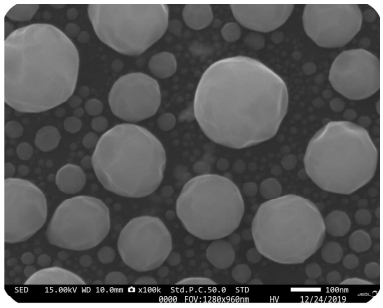
Thermal analysis is variously applicable to characterization of substances, which easily affords accurate analytical information from relatively small amount of samples, which is essential for research related to materials, polymers, petroleum products andbiosubstances. Combination of the thermal analysis with EPMA and PXD, installed in CAC, enables better evaluation of solid materials. This differential thermal balance TG8120/high temperature infrared heater TG-DTA of Thermo plus EVO II/TG-DTA series, developed by Rigaku, has a service temperature from room temperature to 1500°C and the maximum temperature elevation rate of 1000°C /min. The analyzer has a high temperature differential scanning calorimeter DSC8270 and enables simultaneous measurement of TG-DTA and DSC.

X-ray Microanalyzer EPMA



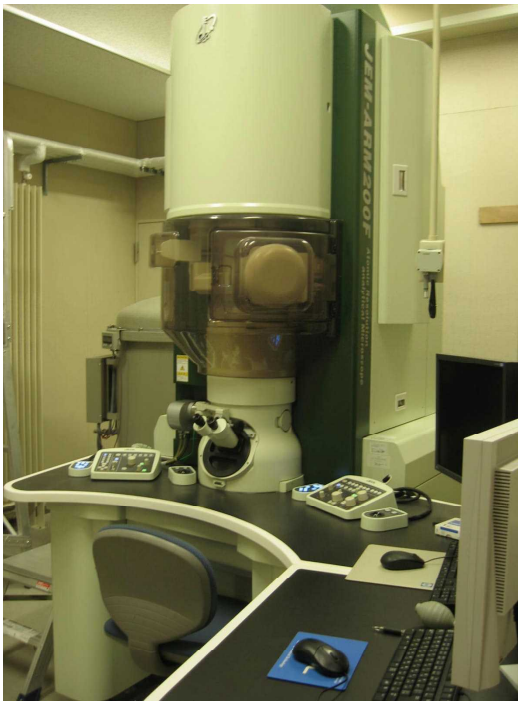
EPMA (Electron Probe Micro-Analyzer) finely narrows generated electron beams from an W electron gun to tens nanometers and accelerates the beams to up to 40 kV to irradiate the surface of solid samples. Determination of elements composing the samples and quantitative analysis of the samples are performable based on the wavelength of characteristic X-rays generated from the samples. Mapping measurement indicating element distribution states and line analysis are also performable. The EPMA has measurability of B ～ U, using 8 analyzing crystals and 4 detectors. Measurability of cathode luminescence is characteristic of this EPMA.

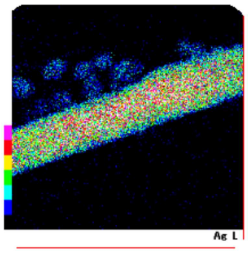
Scanning electron microscope FE-SEM



The scanning electron microscope (JSM-F100) can set the acceleration voltage of the electron beam from 10V to 30kV, and can handle samples that are vulnerable to heat damage and samples of insulation. It also has an option to observe at a lower vacuum than usual. In addition, the performance of elemental analysis using EDS has been greatly improved. Since this JSM-F100 can acquire data while switching between observation and analysis with a simple operation, it is possible to analyze the sample surface efficiently.

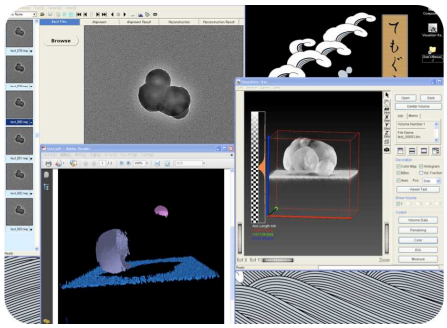
Transmission Electron Microscope FE-TEM





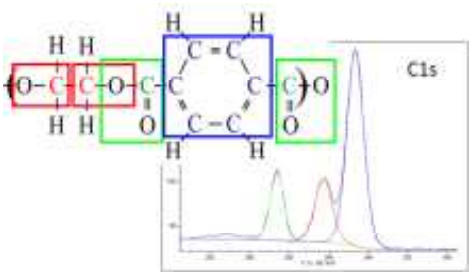
This microscope is a Schottky emission electron gun equipped with a ZrO/W emitter as a cathode, which has higher brightness and a smaller electron source than a thermionic electron gun and affords higher current stability and larger probe current than a normal field emission electron gun. Negative spherical aberration coefficients obtained by an attached spherical aberration corrector (Cs corrector) counteract positive spherical aberration coefficients obtained by a condenser lens having a symmetrical axis of a magnetic field, which enables to acquire smaller and higher intensity probes and to analyze elements with higher resolution. Detecting electrons transmitted through film samples acquires STEM images affording scattering/absorption, diffraction and phase contrasts.

Transmission Electron Microscope 3 D-TEM



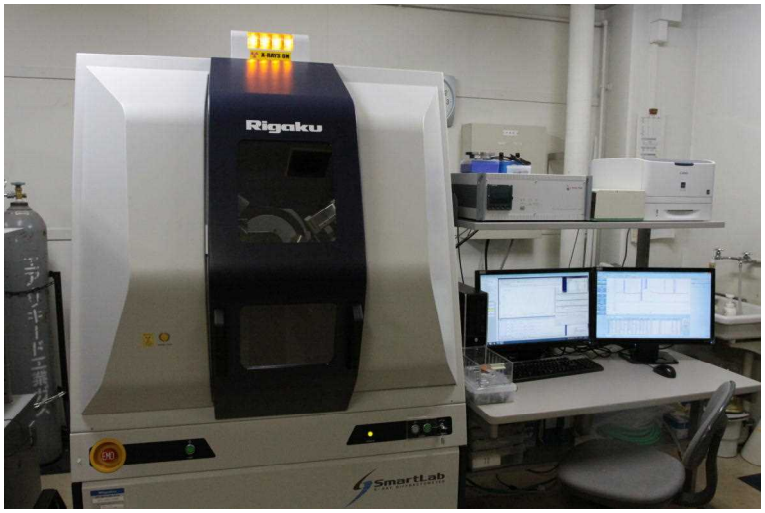
LaB_6 electron gun-equipped transmission electron microscope (200 kV) (JEM-2100) enables high resolution and high contrast observation, which is suitable for observation of biological samples. CCD camera enables to photography TEM images as digital data. High-tilt holder enables to set the tilt angle of samples to up to ±80°. TEM tomography system enables to automatically acquire continuously tilted images. 3D reconstruction of samples and visualization of 3D structures are performable by PC.

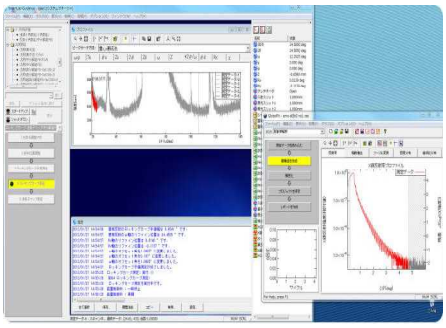
X-ray Photoelectron Spectroscopy XPS・UPS



X-ray photoelectron spectroscopy (XPS), one of the surface analysis instruments, is utilized for the analysis of wide materials such as metal, a semiconductor, organics and ceramics.This method supplies the chemical states of a wide range of elements.About 6nm depth from the surface and several cm^2 area of the sample can be analyzed.Ion etching enables a depth direction analysis.Ultraviolet photoelectric spectroscopy (UPS) is also applicable.

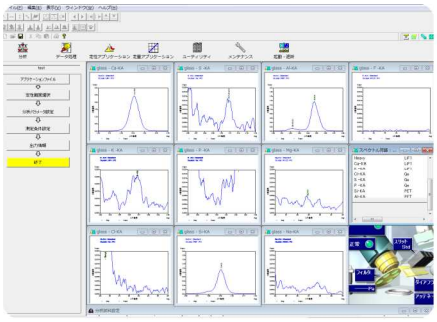
X-ray Diffractometer XRD





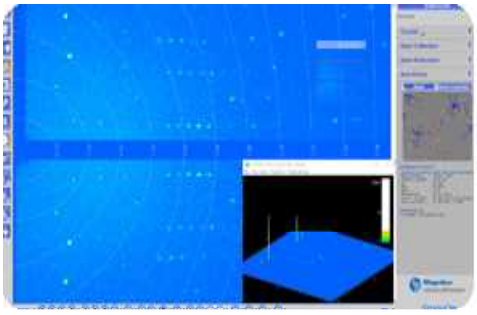
This multipurpose diffractometer measures scattered and diffracted X-rays generated from solid samples by irradiating strong X-rays (45kV, 200mA, Cu), which exhibits remarkable effect on film samples. The diffractometer is applicable to in-plane, film thickness, orientation, particle and void size distribution, and rocking curve measurements. Following guidance function allows users including beginners to easily obtain data. Choosing an incident X-ray source from Ge double crystals or Ge quadruple crystals enables high resolution measurement. The diffractometer has a scintillation detector, a one-dimensional detector enabling fast measurement within several minutes, and ICDD (Ver2. 1102) .

Fluorescent X-ray Diffractometer XRF



A vacuum tube (Rh) of 4kW used as an X-ray source in the XRF diffracts fluorescent X-rays generated from samples with 6 analyzing crystals (LiF, PET, Ge, RX-25, RX-75 and TAP). Two detectors (scintillation counter and gas flow proportional counter) in the WDX enable highly sensitive qualitative and quantitative analyses of various elements (from B to U). The XRF corresponds to powder, bulk and liquid samples. Continuous measurement (turret-type measurement) enables simultaneous measurement of up to 12 samples. The XRF has SQX program performing semi-quantification by FP method without standard samples through qualitative analysis results, and EZ scanning mode to perform SQX analysis.

X-ray Diffractometer for Single Crystals SC-XRD



This single crystal X-ray structure analyzer is equipped with a rotating anti-cathode type high-intensity X-ray source and a 1-photon detection type hybrid pixel detector. The X-ray source can be selected from two sources, Mo and Cu. The detector with zero noise and a wide dynamic range can detect weak and strong reflections at the same time with a high S/N, and also enables high-speed shutterless measurement. Not only for metal complexes and low molecular weight compounds, but also for protein crystals are applicable.

5.Subscription Journals

CAC subscribes to the following journals. Data collections are also available. If you want to read them, please feel free to ask CAC staffs.

Journals

1) Bunseki Kagaku 1952 ~

2) Bunseki 1975 ~

3) Advances in X-ray Chemical Analysis Japan 1974 ~2016

Videos for learning analysis [物質の科学・有機構造解析 (Material Science and Organic Structural Analysis), The Open University of Japan]

CAC Pamphlet, CAC Users' Guide

6.CAC Usage Rules

Please utilize the all instruments in CAC by following CAC usage rules.

- Opening Hours: 8:30 ~ 18:00 (except Saturdays, Sundays and national holidays)
- Utilization of CAC: Procedures under "CAC Web System" is required (p.22).
  (Access to "CAC Web System" in a webpage of CAC.)
- Overtime Utilization: ISIR card is required for utilization of CAC after 17:30 on weekdays, and all days on Saturdays, Sundays and national holidays (p.21).
- No street shoes allowed (the entire building): Use dedicated slippers in footwear boxes in the entrance.
- No smoking: The entire building
- Reprinting: Published articles describing research results have to contain acknowledgements and the reprinted articles have to be submitted to CAC. →The articles are exhibited at the entrance of CAC.

  (e.g.) We thank the members of the Comprehensive Analysis Center, ISIR, Osaka University, for spectral measurements, X-ray diffraction data, and microanalyses.

7.Overtime Utilization

ISIR card is required to utilize CAC during 18:00 to 8:30 on weekdays, and all days on Saturdays, Sundays and national holidays.

1. ISIR-issued ISIR card (Figure 1) is required to enter and exit CAC and laboratories during overtime utilization. Be sure to have the ISIR card.
2. Unlock/lock a door by holding the ISIR card (Figure 1) over an electronic lock controller (Figure 2).
3. The electronic lock controller is contactless, which enables to use the ISIR card even left in a wallet etc.
4. An electronic lock of a laboratory is automatically locked after entering the laboratory. When leaving the laboratory, unlock the electronic lock from the inside of the laboratory.
5. Left an opened door over 30 seconds sounds an alarm. The alarm is stopped and the door is locked when the closed door is confirmed.
6. All electronic locks are unlocked when unexpected power failure happens.
7. In emergency, uncover an emergency cover for the electronic lock of the inside of the entrance or open an emergency exit in every floor to exit.

Figure 1

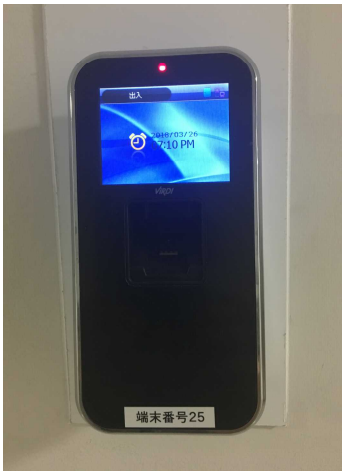


Figure 2

8.CAC Web System

All instruments are required to access to "CAC Web System". Access to the system from the dedicated PC near an instrument or a PC set in each laboratory. The procedure is as follows;

1) Click "CAC Web System" in a webpage (top page) of CAC. Choose the desired instrument shown in a screen (Figure 3). Or you can enter directly from http://133.1.58.227/cacwebs/souti_list.php

2) Find your favorite instrument (Figure 4). The usage status is described in gray letters under the device name. Unavailable operation is described using gray out. (Available now = available, Busy = used, Request Only = request analysis only, Maintenance = under maintenance)

U (blue icon): for starting or stopping the instruments

W (green icon): for waiting after finishing the measurements by others.

RS (red icon): for reserving your favorite time

RQ (yellow icon): for ordering the measurement by technical staff

3) Enter Email address and Password to login (Figure 5).

(Click "Create an account" if you use the system for the first time).

4) Choose your request from Use, Wait, Reserve or Request.

5) When finishing the input to the system, click Logout in the left side of the screen.

Note: The system is automatically disconnected by left no operation of the system over 30 minutes. Re-login to re-access to the system.

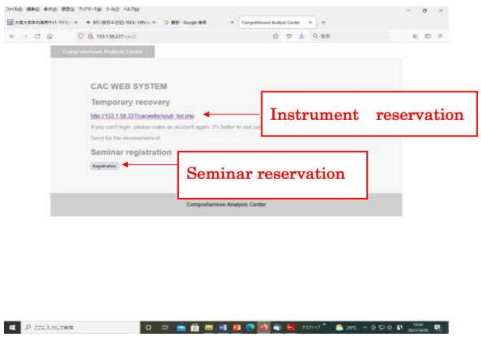


Figure 3

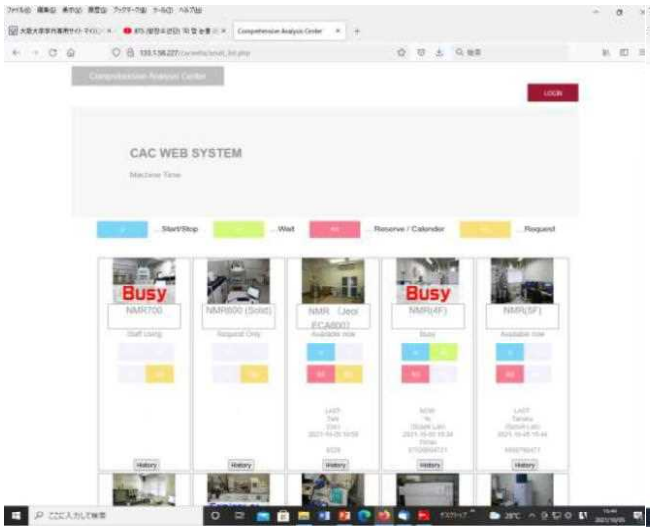


Figure 4

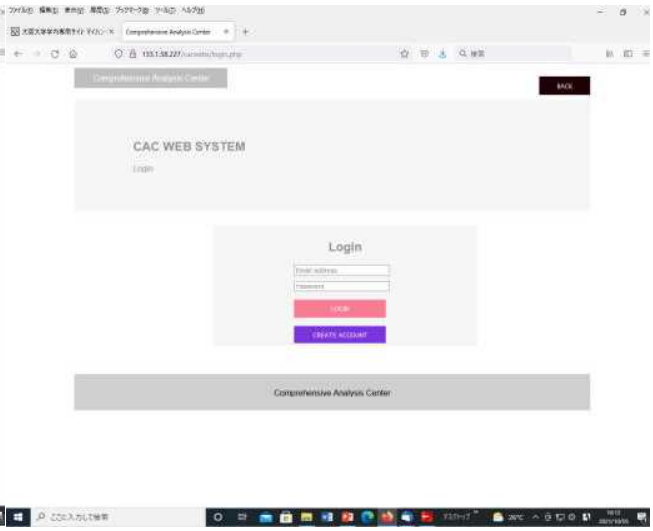


Figure 5

9.Reservation Procedures

・Self Measurement

1) After the login, click “U” button of the desired instrument (P.22, Figure 4, 5).

2) Choose the utilization time. Click "Start" button when starting measurement (Figure 6).

3) Click "Stop" button when you finish the measurement (Figure 7) Fund Code is used for choosing the payment source for the measurements. Please confirm the code number to your supervisor. In the following screen input the measurement information and comment if need (Figures 8, 9).

*If next user is waiting, please contact the next user by telephone.

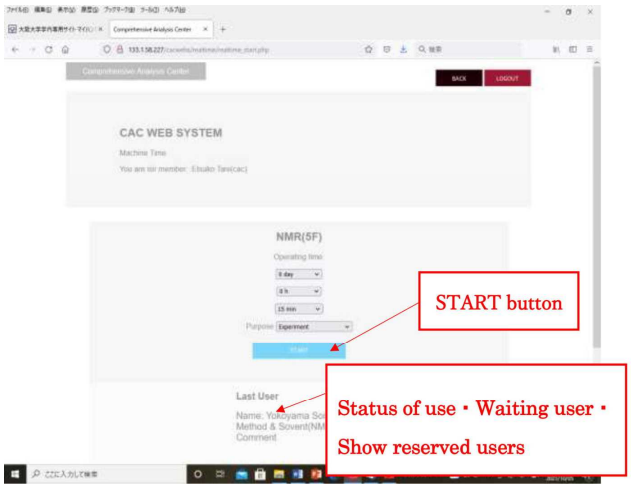


Figure 6

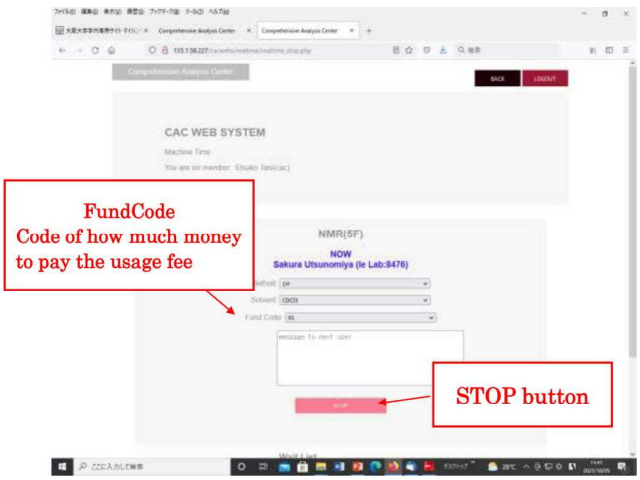


Figure 7

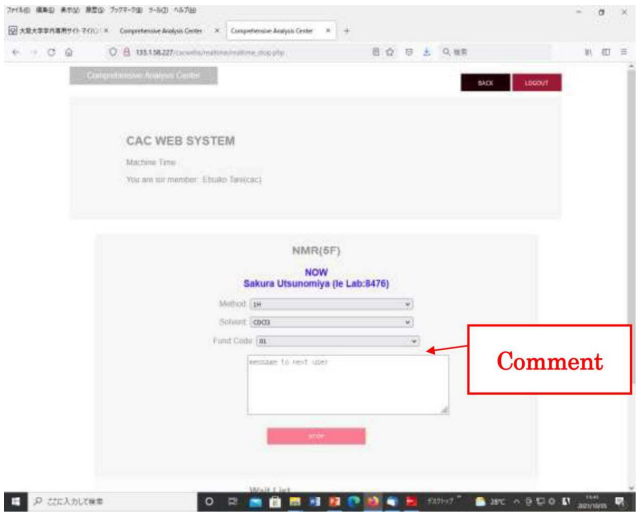


Figure 8

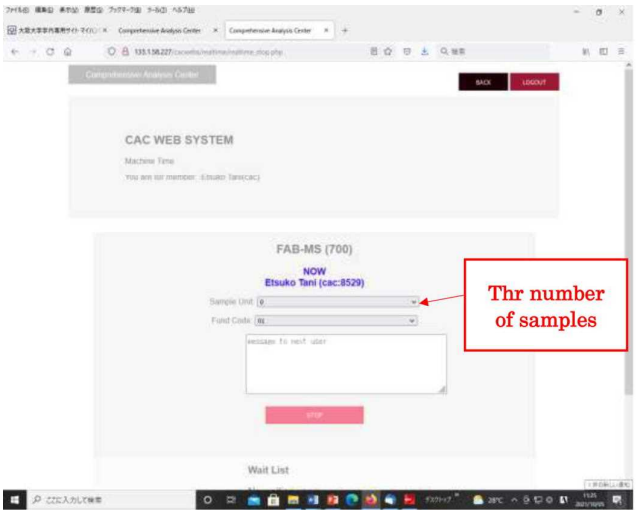


Figure 9

If the instrument is in use

1) Click "W" button. After choosing a utilization time and again Click "Waiting" button (Figure 10).

※Don't forget press the "start" button when you start measurement.

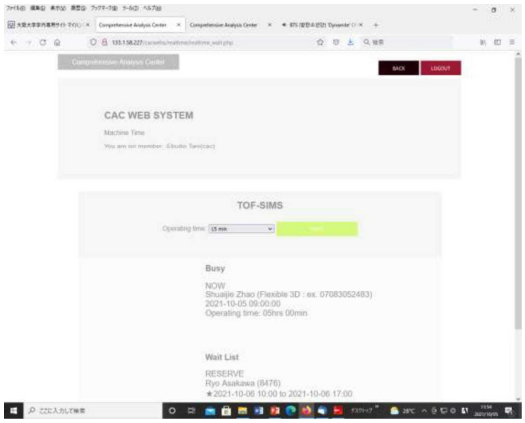


Figure 10

If you perform measurement on a specific date and time or long-time measurement at night.

1) Click "RS" button. After choosing a utilization time and again click "RESERVE" button (Figure 11).

※Performing "RESERVE" is available for a reservation after 3 hours or later from the present time.

※Perform "Waiting" for a reservation within 3 hours from the present time.

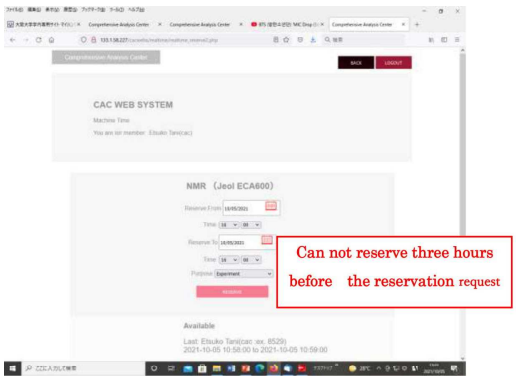


Figure 11

Notes on the reserve button and wait button

When the time comes for you to use the system, click the "U" button to start the system, and then click the "U" button again to stop the system when the time is up. If you want to cancel your reservation, click on the "Reserve" button, and the "Cancel" button will appear in the field where you made your reservation. If you leave the reservation without canceling it, you will be charged. If you have made a reservation using the "Wait" button and have become the NextUser, please click the "U" button within 5 minutes to start. If you do not start within 5 minutes, your reservation will be voided and the next person will become the NextUser.

・Request Measurement

Request measurement is available for special measurement methods and nuclides and/or users with no utilization experience.

1) After the login, click "RQ" of Request of the device used. (P.22, Figure 4, 5).

2) Enter information about a sample and click ”Request” (Figure 12).

3) A record with the information about the sample is created (Figure 13). Print out and submit the 1 record with a sample to a staff of the measurement.

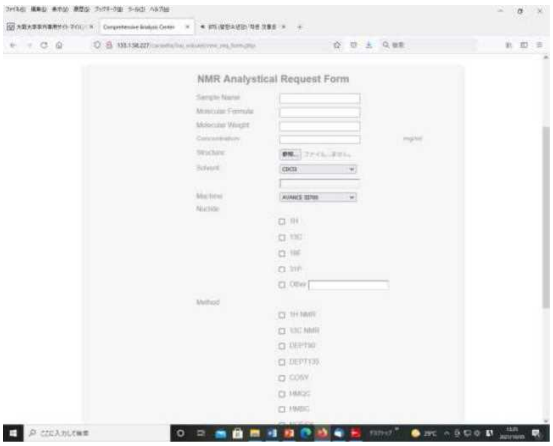
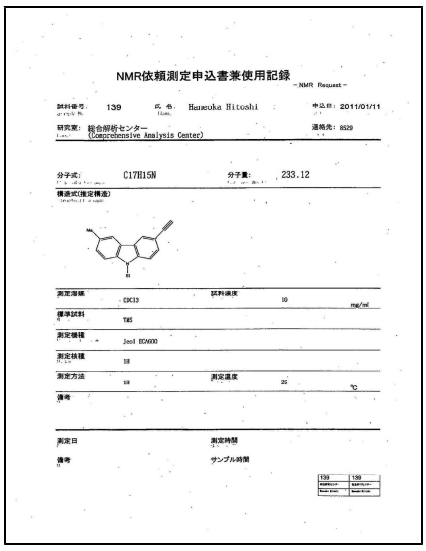
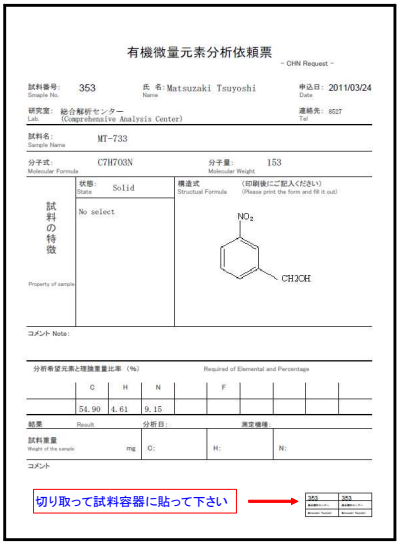


Figure 12



NMR request

MS request



Elemental Anal request

Figure 13

・Other request Measurement

Utilization of transmission electron microscope is reservable from 10 am on every Thursdays in room 105 in the 2nd Building.

*Utilizing JEM-ARM200F is not reservable by accessing to CAC Web System.

(a) Request Measurement

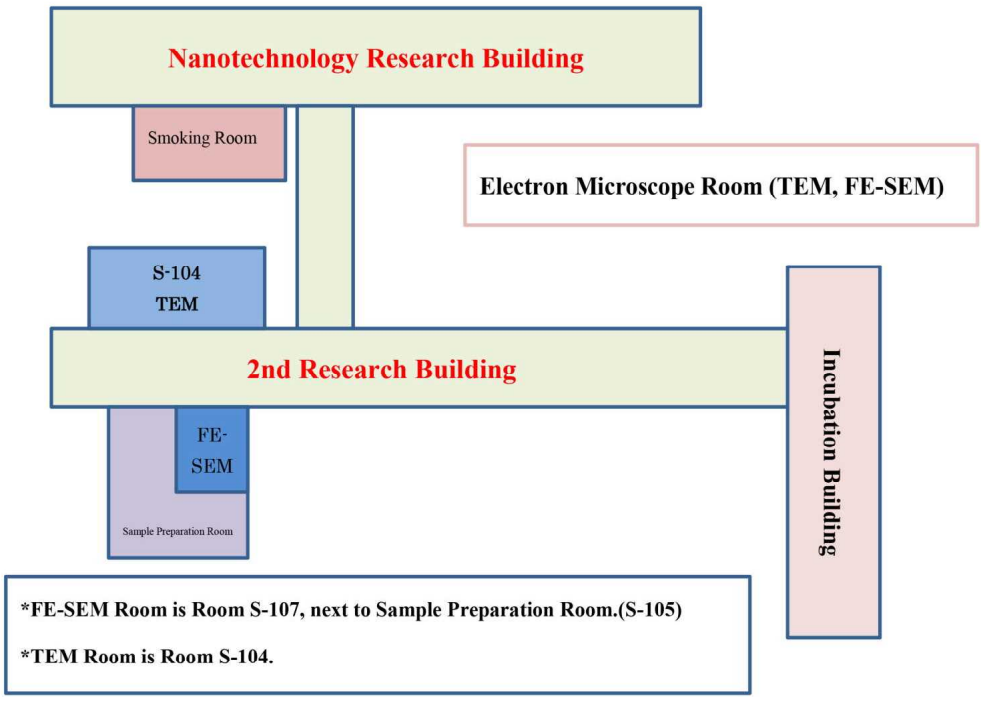
・Please feel free to discuss measurement and preparation method for samples. Please come in Room 105 (Sample Preparation Room) in the 2nd Building.

(b) Self Measurement

・Fulfill the both following requirements; utilization experience of any electron microscopes and permission by a CAC staff .

(c) Sample preparation

・A lecture on the sample preparation is held if needed.



10.Intramural and Extramural Cooperation

Collaborative Research Facility Network, former Effective Utilization Network for Chemistry Research Facility, centering on Institute for Molecular Science, National Institutes of Natural Sciences in 2007, promotes extramural cooperation. The network in the western Kinki region is positioned in Osaka University.
Assoc. Prof. Suzuki of CAC became the chairperson of the network of the western Kinki region since 2021. See the following webpage for details.

Center for Scientific Instrument Renovation　http://www.reno.osaka-u.ac.jp/index.htm

A part of instruments in CAC is served for intramural and extramural cooperation by cooperating with Center for Scientific Instrument Renovation. Center for Scientific Instrument Renovation, with the developmental reorganization of Manufacturing Center, was established in the 1st of April, 2007. Fundamental instruments for research and education, with conventional supports of "manufacturing", research and education by Manufacturing Center, are repaired, restored and reborn to promote "reuse promotion" with intramural cooperation between staffs and students.

Collaborative Research Facility Network　http://chem-eqnet.ims.ac.jp/index.html

11.Pleas from CAC

Contributions to research in CAC have to be persuasively exhibited due to transforming Osaka University into a national university corporation.

When articles describing research results acquired by using instruments in CAC are submitted, the articles have to contain acknowledgements (See p.20 of CAC Users' Guide). Additionally, when the articles are printed and published, submit one reprint of each of the articles to CAC.

CAC annually publishes CAC Information with research results acquired by using the instruments in CAC. The reprinted articles are exhibited at the entrance of the 1st floor of CAC. The articles have been favorably received by not only CAC users but also CAC visitors including high school students.

CAC staffs wish furthermore developments of research of all users' by using the instruments in CAC

12.Floor room