

Equipment and Facilities of National Institute for Materials Science

March 9, 2018

The followings are facilities which are provided for shared use to any person who engages in scientific and technological research and development outside the National Institute for Materials Science.

(※ : Available Use for The Nanotechnology Platform Program; by Ministry of Education, Culture, Sports and Technology.)

1. Research Network and Facility Services Division

1) Materials Manufacturing and Engineering Station

1. Cold crucible levitation melting furnace
2. 5kg vacuum induction furnace
3. 20kg vacuum induction furnace
4. Pressure electro slag remelting furnace
5. Forging machine
6. 2Hi hot rolling machine
7. Caliber rolling machine
8. 4Hi cold rolling machine
9. 70ton swaging machine
10. 18ton swaging machine
11. Furnace for forging and rolling(max.1,250°C)
12. Movable furnace for forging and rolling(max.1,200°C)
13. Deformation rate control caliber rolling machine
14. Furnace for caliber rolling(max.1,250°C)
15. Furnace(max.1,400°C)
16. Furnace for annealing(max.850°C)
17. Electron beam welding machine
18. Lath cutting machine for glass working
19. High vacuum evacuation device for glass working

[Inquiry about Materials Manufacturing and Engineering Station](#)

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2) Materials Analysis Station

1. Glow Discharge Mass Spectrometer (VG9000)
2. Micro Energy Dispersive X-ray Fluorescence Spectrometer (ORBIS PC)
3. Sequential Type Inductively Coupled Plasma Optical Emission Spectrometer (ICPS8100CL)
4. Simultaneous Type Inductively Coupled Plasma Atomic Emission Spectrometer (icap6300)
5. Double wavelength CCD-type single crystal diffractometer with low-temperature equipment (VariMax DW with Saturn)
6. Field Emission Electron Probe Micro-Analyzer (JXA-8900R 改)
7. Ultra Low Voltage Field Emission Scanning Electron Microscope (SU8000)
8. Ultra High Resolution Field Emission Scanning Electron Microscope (S-5500)
9. Cross-section Polisher (SM-09020CP)
10. Scanning Auger Electron Microprobe (JAMP-9500F)
11. Scanning Auger Electron Microprobe (PHI 680) ※
12. X-ray Photoelectron Spectroscopy (Quantera SXM)
13. Field Emission Electron Probe Micro-Analyzer (FE-EPMA) (JXA-8500F) ※
14. Electron Probe Micro-Analyzer (JXA-8900RL)
15. Field Emission Scanning Electron Microscope (JSM-6500F)
16. Scanning Electron Microprobe (JSM-6510)
17. Nitrogen/Oxygen Determination (LECO TC600) ・
Hydrogen Determination (LECO RH404) ・
Carbon/Sulfur Determination (LECO CS444LS)
18. Inductively Coupled Plasma Atomic Emission Spectrometer (720 ICP-OES)
19. Double Focusing Magnetic Sector Field ICP-MS (ELEMENT XR)
20. Femtosecond Laser System (IFRIT)
21. Inductively Coupled Plasma Optical Emission Spectrometer (SPS3520UV-DD)
22. Temperature variable type powder X-ray diffractometer
23. High-power and high-sensitivity type powder X-ray diffractometer
24. Compact type powder X-ray diffractometer
25. Time-of-flight Secondary Ion Mass Spectrometry (TOF-SIMS) ※
26. High-sensitivity type powder X-ray diffractometer
27. Ion chromatograph system

[Inquiry about Materials Analysis Station](#)

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3) Transmission Electron Microscopy Station

1. Real working environment physical characterization TEM (JEM-ARM200F-G) ※
2. 300kV transmission electron microscope (Tecnai G2 F30) ※
3. 200 kV field-emission transmission electron microscope (JEM-2100F1) ※
4. 200 kV field-emission transmission electron microscope (JEM-2100F2) ※
5. 200kV transmission electron microscope(JEM-2100) ※
6. Focused Ion Beam systems (JEM-9320FIB, JEM-9310FIB1, JEM-9310FIB2, JIB-4000) ※
7. Field emission scanning electron microscope (JSM-7000F) ※
8. Ultramicrotome (Leica EM UC6) ※
9. HRTEM Analysis system ※
10. Electron tomography analysis system ※
11. TEM sample preparation apparatus ※
12. 300kV field emission transmission electron microscope (JEM-3000F) ※
13. High voltage transmission electron microscope (JEM-ARM1000)
14. Atomic-resolution analytical electron microscope (FEI-Titan Cubed) ※
15. Scanning transmission electron microscope (HD-2300C)
16. Cold-FEG transmission electron microscope (HF-3000S) ※
17. Cold-FEG Lorentz microscope (HF-3000L) ※
18. 100kV transmission electron microscope (JEM-1010)
19. 200kV transmission electron microscope (JEM-2000EX)
20. Ultrahigh vacuum transmission electron microscope (JEM2000VF)
21. Dual Beam system ※
22. Pick-up system ※
23. Real working environmental electron holography microscope (JEM-ARM200F-B) ※
24. Focused ion beam system (Hitachi FB-2000S) ※

[Inquiry about Transmission Electron Microscopy Station](#)

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4) Synchrotron X-ray Station at SPring-8

1. Hard X-ray photoelectron spectrometer with an automatic sample exchange device ※
2. Hard X-ray Photoelectron Spectrometer ※
3. High-resolution X-ray powder diffractometer ※
4. 8-axis diffractometer for structural analysis of functional thin films ※

[Inquiry about Synchrotron X-ray Station At SPring-8](#)

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5) High Magnetic Field Station

1. Hybrid Magnet
2. Water-Cooled Magnet
3. 18T Superconducting Magnet
4. 15T Split-Paired Magnet
5. 10T Cryocooler-Cooled Magnet
6. Vibrating Sample Magnetometer (VSM)
7. 12T Cryocooler-Cooled Magnet
8. 20T Superconducting Magnet with dilution refrigerator
9. 20T Superconducting Magnet with 3He cryostat
10. 17T Superconducting Magnet with 4He VTI cryostat
11. 500 MHz Solid-State NMR (I) ※
12. 500 MHz Solid-State NMR (II) ※
13. 300 MHz Solid-State NMR
14. 930MHz Solid-State NMR Magnet
15. Advanced magneto-optical system
16. 800MHz Solid-State NMR ※
17. Large Bore 17T Magnet
18. Cryocoil MAS Probe
19. Devices for optical observation and control of material processings under high magnetic fields
20. Helium liquefier system

[Inquiry about High Magnetic Field Station](#)

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6) Nanotechnology Innovation Station --- Nano-fabrication Group

- 6)-1 Foundry at Sengen-site
1. 100kV-EB Writer ※
 2. Laser Lithography System ※
 3. Mask Aligner ※
 4. Nano-Imprint Lithography System ※
 5. Automatic Sputtering System ※
 6. UHV Sputtering System ※
 7. E-gun Evaporator ※
 8. UHV E-gun Evaporator ※
 9. Atomic Layer Deposition System (1) ※
 10. Plasma-Enhanced CVD System ※
 11. CCP-RIE System ※
 12. ICP-RIE System ※
 13. Silicon Deep-RIE System ※
 14. High Power ICP-RIE System ※
 15. FIB-SEM Dual Beam System ※
 16. Rapid Thermal Annealing System ※
 17. Thermal Oxidation and Annealing Furnace ※
 18. FE-SEM ※
 19. Atomic Force Microscope ※
 20. 3D Measurement Laser Microscope ※
 21. Dicing Saw (1) ※
 22. Automatic Scriber ※
 23. Chemical Mechanical Polishier ※
 24. Wire Bonder (1) ※
 25. Room Temperature Probing System ※
 26. Cryogenic Probing System ※
 27. 125kV-EB Writer ※
 28. Maskless Lithography System ※
 29. Wet Station ※
 30. CAD System ※
 31. Clean Room ※
 32. Wafer RTA system ※
 33. High-pressure jet liftoff system ※
 34. Plasma Asher (1) ※
 35. UV Ozone cleaner ※

36. Excimer Cleaner ※
37. Ellipsometer ※
38. Surface Profiler ※
39. Ion Sputtering System ※
40. Os Coater (2) ※
41. LN2 Prober ※
42. Thin Film Stress Measurement System ※

6) - 2 Foundry at Namiki-site

1. Spectroscopic Elipsometer
2. FE-SEM(SU8230) +EDX
3. Surface Profilometer
4. E-beam Evapulator
5. Resistive Heating Evaporator
6. Sputtering System #1
7. Sputtering System #2
8. Pulsed Laser Deposition System
9. Atomic Layer Deposition System (2)
10. E-beam Drawing System
11. Contact mask aligner
12. Dry Etching System
13. Plasma Asher (2)
14. Focused Ion Beam System
15. Dicing Saw (2)
16. Room Temperature Prober
17. Low Temperature Prober
18. Wire Bonder (2)
19. RTA (Rapid Thermal Annealing Furnace : 6 inch)
20. RTA (Rapid Thermal Annealing Furnace : 20 mm)
21. Oxidation Furnace
22. Cleanroom at Namiki-site
23. Atomic Force Microscopy
24. TEM
25. XRD (Thin film)
26. XRD (Powder)
27. TG/DTA+DSC

28. High Temperature TG/DTA+DSC
29. Zeta-potential/Particle-size analyzer
30. Mechanical Testing Machine
31. Micro Raman Spectrometer
32. FT-IR
33. UV-Vis-NIR Spectrometer V-570
34. UV-Vis-NIR Spectrometer V-7200
35. Fluorescent Spectrometer
36. Micro PL Spectrometer
37. Multi-Mode SPM
38. Color Laser Microscope
39. FE-SEM (S-4800) +EDX
40. FE-SEM (SU8000) +EDX
41. Mini SEM +EDX
42. Cooling Centrifuge

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7) Nanotechnology Innovation Station --- Nano-biotechnology Group

1. LC/MS/MS ※
2. Confocal laser scanning fluorescence microscope ※
3. NMR ※
4. Total Internal Reflection Fluorescence Microscope ※
5. Nano-search microscope ※
6. Raman microscope ※
7. Real time PCR ※
8. Surface plasmon resonance analyzer (Biacore) ※
9. Circular dichroism spectropolarimeter ※
10. Recycling GPC ※
11. Desk Top Electron Microscope ※
12. Freezing microtome ※
13. Plate reader ※
14. Glove Box ※
15. LC/MS/MS (Q-exactive) ※
16. Microarray scanner ※

17. Laser Micro Dissection system ※
18. Cell sorter and analyzer ※
19. Fluorescent Microscopes ※
20. Bio-molecule centrifuges and chromatographs ※
21. Material preparation instruments ※
22. Material analysis instruments ※
23. Photometers ※
24. Nanomaterial analysis instruments ※
25. Analytical GPCs ※
26. FT-IR spectrometer ※

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8) Microstructural Characterization Platform

1. Low Temperature Scanning Tunneling Microscope with superconducting magnets ※
2. Environment-Control Frequency-Modulation Scanning Probe Microscope ※
3. Multifunction Scanning Probe Microscope ※
4. Atom-discriminating electron microscope (JEM-3100FEF) ※
5. Ceramics sample preparation facilities ※
6. Low Temperature Scanning Tunneling Microscope ※
7. 3D multi-scale triple-beam analytical microscope ※
8. Damage-less TEM specimen milling apparatus ※
9. Microfocus X-ray CT ※
10. Helium Ion Microscope ※
11. Surface area and pore size analyzer by gas sorption ※
12. Spin-polarized low energy electron microscope ※

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2. Center for Research on Energy and Environmental Materials Division --- Battery Research Platform
 1. Super-Dry Room

2. Cell Assembly Equipment
3. FTIR
4. Laser Raman Microscope
5. Ellipsometer
6. Gas Transmission-rate Measuring Equipment
7. TG/MS
8. Compact SEM
9. Laser Microscope
10. Viscometer
11. Battery Charge/Discharge System
12. Precision Electrochemical Measurement System
13. Single-Particle Measurement System
14. ICP/MS
15. LC/MS
16. Ion Chromatography
17. O₂,N₂,H₂ analyzer
18. GD-OES
19. GC/MS
20. Mass Spectroscopy
21. XRF
22. XPS
23. HAXPES
24. XRD
25. BET
26. Particle Size Analyzer
27. Environment-controlled SPM
28. TOF-SIMS
29. TEM/STEM
30. FIB
31. FIB-SEM
32. SEM
33. Scanning Auger Electron Spectroscopy
34. Cross-section polisher

[Inquiry about Battery Research Platform](#)

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3. Center for Materials Research by Information Integration Division --- Data Platform

1. NIMS Materials Database (MatNavi)

[Inquiry about Data Platform](#)

E-Mail: matnavi-ss@ml.nims.go.jp (Please change [=] to [@])

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