MPMS3

Last Updated: 04042024

You must be a "Qualified Self-User" to operate this instrument independently.
You must be on the labs "Instrument Reservation Schedule" before touching the instrument for any reason.
Any & All problems, STOP, Post a note on the instrument and send an email to mtim@mit.edu immediately.
Do not perform any maintenance, Do not install any software, Do not adjust anything.

Instrument Hazards:
Liquid Helium
Electrical: 110-120V, 60Hz
Noise: Loud He Compressor

Required Apparel:
Safety Glasses, Lab Jacket, Hearing Protection, Gloves when handling sample rods/holders.

CORAL:
Reserve The instrument using CORAL.
Engage the instrument using CORAL when you enter the lab.
Disengage CORAL when you are leaving the lab.
Report all problems immediately to mtim@mit.edu.

Tim McClure
mtim@mit.edu
(617) 258-64
77 Massachusetts Avenue, 13-4149
Cambridge, MA 02139

Checkout the instrument out when you arrive
Multiview Software is open
Field: 0
Temperature: 300k
Chamber pressure: Below 20torr (Sealed)
Evercool Temperature: Below 5k
Helium Compressor – Running (Loud)
He Gas Cyl >1000psi
No Sequences are running.

Important: Potential Instrument Damaging Actions
If the Helium Compressor shuts off, Re-Enable it immediately.
If you lose your sample in the chamber.
Send an email immediately to mtim@mit.edu if you have any problems.
Do not leave the sample chamber venting for prolonged periods to conserve helium.

Known Problems
Gas bottle #2 – Red

Motor Sync Error – Restart computer and software.

Helium Compressor Shuts off – Reenable the compressor immediately if it shuts off. The helium level is unusually high? This means there is less gas to vent the sample chamber. Try to minimize the time you are loading samples.

Sample Centering Offset
When centering your sample it finds your sample at ~70mm not the expected 63mm. This is ok. Your sample is actually placed at 63mm for the measurements.

Samples:
If you leave your sample in the chamber when it is the next users turn:
Your sample will be removed and placed in the sample old sample bin.
If your sample is on a sample holder it may be removed.

Sample Holders:
Brass
Quartz
Powder - 4096-388
Liquid - 8505-013
Gelatin Caps
Straws

Sample Mounting:
Varnish
Duco Cement
Kapton Tape
Acetone

Abbreviated Operation Procedure
Mount your sample.
Load your sample.
Create a sequence.
Run Sequence.
Unload Sample.
Purge and Seal the chamber.

Finishing
Samples
Unload your sample or leave clear instructions for the next user.
The standard operation is that the next user will remove your sample.

Verify
Multiview Software is left open

Field: 0
Temperature: 300k
Chamber pressure: Below 20torr (Sealed)
Evercool Temperature: Below 5kpa
Helium Compressor – Running (Loud)
He Gas Cyl >1000psi
No Sequences are running.
Cleanup before leaving !!!

Specifics
https://mtim.mit.edu/MPMS

Web Description/Theory

Data Formats

Computing
Internet Access
USB

Saving data
Walk away with a copy of any data that is important to you.
Do not expect your data to be saved on this computer.

Computer Restarting
Name: (blank)
Password: (blank)

If an error message is encountered.
If the error persists:
Stop using the instrument (prevents possible damage).
Report the problem to mtim@mit.edu immediately.

Utilities:

Electricity (wall).
Helium Gas Cylinders
Process Water
Chiller

Emergency Shutdown:
See help files

Restart after an emergency:
See help files

Training:

Introduction to the MPMS3 – You tube video:
https://www.youtube.com/watch?v=SdirI2kkdO8&ab_channel=QuantumDesignUSA

Quantum Design Pharos Digital Library – Register for free account:
https://www.qdusa.com/register/account/login

Reservation Rules:

Non-staff members may only make reservations 14 days in advance for all other pieces of equipment. Staff members may make reservations at any time. 14 days means that the end time of the reservation falls within the 14 days.
15 minute rule
If you do not engage the resrved instrument within 15 minutes of your start time, someone else may use the instrument.

MPMS3 Training

Last updated 20230201

Safety
Room Hazards (13-4148)
Cryogenic Liquids, Gas Cylinders & Chemicals.

Required Personal Protection
Safety Glasses, Lab Jacket, Ear Plugs
No Food No Drinks.

Emergencies Dial 100 (from an MIT Phones)
MIT Police (617) 253-1212

Personal Protective Equipment Available:
Safety Glasses, Safety Goggles, Face Shield, Lab Jackets, Nitrile Gloves, Cryogenic Gloves, Hearing, Protection, Eye Wash, Safety Showers (13-4139 Only), Spill Kits, Masks, Hand Sanitizer, 70% Alcohol Spray, HF Burn Cream, PH Test Strips, First Aid Kit, Broken Sharps Container.

Building 13 Chemical Hygiene Plan:
https://mitmrsec.mit.edu/sites/default/files/documents/MRL%20Chemical%20Hygiene%20Plan%20060119.pdf

Chemicals: Only used in Exhaust Hood,
Chemical Inventory 13-4139 & 13-4148 (In locked chemical cabinets).
https://www.dropbox.com/s/ob1ecr9t6pkxo6a/Chemical%20Inventory%2020201117.xlsm?dl=0

After Hours work: Independent MIT Instrument Users receive 24 Hour Access with their MIT ID.
You must follow the MIT working alone policy:
https://mitmrsec.mit.edu/sites/default/files/documents/Working_Alone_Policy_0.pdf
No Undergraduates, No Cryogenic Liquid handling, No Chemical work
You must have the instrument reserved before entering the lab after hours

Instrument Data: Walk away at the end of your session with a copy of any data that is important to you. The instrument hard drives are periodically purged.

Emergency Information

X

It is very important to note that to contact police, ambulance, and fire on campus, dial **100** from campus phones or **(617) 253-1212** from all other phones. It is strongly recommended that you program the MIT Police number into your cell phone.

EMERGENCY CONTACT	EMERGENCY DETAILS
Campus Emergencies (MIT Police) From campus phones, dial 100 From other phones, dial 617-253-1212	24-hour police, ambulance, fire, first aid, dean on call
Dean on Call - Outreach and support for students in need Dial 100 from campus phones or 617-253-1212 to reach MIT Police, then ask to speak to the Dean on Call.	The service is available Monday through Friday, 5PM - 9AM, and all weekend on Saturday and Sunday and on MIT-observed holidays. In the event of student emergencies, DSL staff and others from across MIT volunteer for the Dean On-Call system, which is just a phone call away.
Major Spill Dial 100 or 617-253-1212 and report incident to supervisor	Major hazardous material and waste spills
Minor Spill Days: 617-452-3477 Nights/Weekends: 617-253-4948	Minor hazardous materials or waste spills that present no immediate threat to personal safety, health, or the environment
MIT Medical Dial 617-253-4481	Call 617-253-4481, day or night, for medical advice. You'll speak with a triage nurse who may direct you to a hospital emergency room or MIT Medical's Urgent Care Service
MIT Mental Health and Counseling Weekdays, 8am-7pm: 617-253-2916 Nights/weekends: 617-253-4481 Walk-in urgent hours: M-F, 2pm-4pm	For urgent issues, a mental health clinician is on call and available to students 24 hours a day, seven days a week
MIT Facilities Dial 617-253-4948	24-hour emergency repairs
MIT Alert	Emergency notification system that uses numerous electronic methods to rapidly inform the community of what is occurring, where it is occurring, and what actions to take to stay safe.

Lab webpage where you will find the instrument specifics
http://mtim.mit.edu/asef-otc-web

Lab Usage:
Reserve the instrument using CORAL.
When you arrive, Engage. When you leave, Disengage.
Any problems, STOP, post a note on the instrument and send an email to mtim@mit.edu immediately.
Do not perform any maintenance.
Do not adjust anything.
Follow the SOP
Cleanup when finished.
When you get qualified to use an instrument it is for that type of sample/form only.
Contact Tim prior to analyzing any other types of sample than was covered in your training.

Calendar: https://mtim.mit.edu/calendar
Training for the Magnetic Property Measurement System (MPMS)) to become an independent user.
Bring your (Non-Hazardous) sample in whatever form is most convenient.
We will work together until we are both comfortable with your safe and successful operation of the instrument in a shared facility environment. This is usually one session <2hours.

Please review the MPMS Introduction video before we meet:
https://mtim.mit.edu/MPMS

All are welcome
Prerequisite: Your charges are allocated in MRL MUMMS database.

Bring your (Non Hazardous) sample.
We will meet at 13-4149.

Massachusetts Institute of Technology (https://web.mit.edu/)
Materials Research Laboratory (https://mrl.mit.edu/)
MAX Shared Facility (https://mrl.mit.edu/index.php/shared-experimental-facilities/labs/materials-analysis-and-x-ray-facility-max)

Minimize the time purging the sample area to conserve helium

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