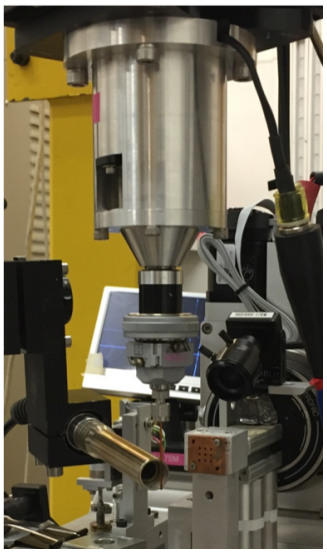
EnviroCells Documentation

Release 0.1.1

Argonne National Laboratory

Jan 17, 2020

Contents



The sample environments and their infrastructures are mostly dedicated to individual beamlines at the APS. An overview of solutions for various in situ and operando applications is given here and will be continuously expanded _ [B1].

CHAPTER 1

Content

1.1 About

Meetings - Every 4th Thursday of the month in Building 401/Room A1100, sample environments and their infrastructures are discussed addressing specific topics. Contributions in the form of 1-10 slides are welcome. The slides will be added to the collection.

Mailing List - Subscribe to the mailing list to receive the latest information, find competent contacts, and participate in discussions. If you want to send an email, the address is: sei-forum@lists.anl.gov

FAQ - Frequently asked questions will be collected for fast access to potential solution

For general information or suggestions, please contact Uta Ruett.

You can also get in touch with Ivan Kuzmenko and Phil Ryan.

1.2 Environment Cell

1.2.1 Furnace

Type	Temp. Range	Atmosphere	Image	Commercial	Contact	Loan	Info	
Blower	up to 1000 °C	Helium		No	Peter Eng	No	Simple to build	1
Blower	up to 650 °C	Air		Yes: Leister LE MINI	Wenqian Xu	Ask	box link 0002	2
Flow Cell	up to 1000 °C	Yes		No	Kevin Beyer	Yes, if not in use	box link 0003	3
Flow Cell	up to 1000 °C	Yes		No: made of commerical parts	Leighanne Gallington	Yes, if not in use	box link 0004	4
Batch	~ 450 °C	Air		No: NMR tubes as capillaries in a steel block	Leighanne Gallington	Yes, if not in use	box link 0005	5
Flow Cell	up to 1150 °C	Yes		No: capillaries connected to gas system	Matt Frith	Yes, if not in use	Flow cell with spinner	6
Infrared	up to 1100 °C	Air		No: general purpose, bulk solid material	Jun Sang Park	bulky, difficult to move	box link 0007	7
Linkham TS1500	up to 1300 °C	Yes		Yes: small solid material	John Okasinski	Yes, if not in use	box link 0008	8
Induction	up to 1500 °C	Air		No: very fast heater, conductive material	Andrew Chuang	Hard to move	box link 0009	9
Induction	up to 1000 °C	Air		No: water cooled	Pavel Shevchenko	Ask	box link 0010	10
Induction	up to 1500 °C	Air		Yes: THM 200 heater, BK power supply, PTC 10 controller, 3 AWG welding wires, plus custom water cooler	Alex Deriy	Ask	box link 0011	11

1.2.2 Press

Type	Temp. Range	Pressure	Image	Commercial	Contact	Loan	Info	
VX-3 Paris-Edinburgh	up to 2000 °C	0.1-7 GPa		Yes	Ross Hrubiak	No	box link p0001	1

1.2.3 Liquid

Type	Discharge (ml/min)	Image	Notes	Contact	Loan	Info	
Peristaltic	0.45		commercial Model RP Q1	Ivan Kuzmenko	No	box link l0001	1
Peristaltic	100		commercial PRODUCT ID 1150	Ivan Kuzmenko	No	box link l0002	2
Custom	see info		see info	Cunming Liu	No	box link l0003	3
Flow cell	see info		room temperature	Xiaobing Zuo	No	box link l0004	4
Flow cell	see info		4-80 °C	Xiaobing Zuo	No	box link l0005	5
Syringe pump	see info		commercial Hamilton microlab 600	Xiaobing Zuo	No	box link l0006	6
Syringe pump	see info		commercial Multi valve Tricontinent	Xiaobing Zuo	No	box link l0007	7
Custom	see info		auto sampler (see info)	Xiaobing Zuo	No	box link l0008	8

1.2.4 Cryostat

1.2.5 Interfaces

Type	Temp. Range	Atmosphere	Image	Commercial	Comment	Contact	Loan	Info	
MBE	30K to 1600K	UHV		No	permanent setup in 33-ID	Hawoong Hong	No	box link 0001	1
Humidity Chamber	15 to 50 °C	Air+ RH 10-95%		Yes: ETS model 5503		Chris Benmore	No	box link 0002	2
Fluid-Solid Cell	up to 350 °C	No		No	high pressure up to 40 MPa	Changyong Park	Maybe, please ask	box link 0003	3

1.3 Infrastructure

1.3.1 Cabinets

List here all cabinets

Location	Available	Contact	Comment
438	yes		

1.3.2 Analyzer

List here all analyzers:

Location	Available	Contact	Comment
438	yes		

Analyzer one

Analyzer two

1.3.3 Pumps

List here all pumps

Location	Type	Contact	Comment
438	turbo		

Pump one

more detailed description with photos, links to manual etc.

Pump two

1.3.4 Glove Box

List here all glove box

Location	Available	Contact	Comment
438	yes		

Glove Box one

Glove Box two

1.4 Contribute

If you are familiar with sphinx readthedocs and github you can add a new environment cell or infractructure Envirocells by starting a new pull request.

If you are not familiar with these tools send an email to sei-forum@lists.anl.gov including a description using this template and a pull request will be opened for you.

1.5 References

CHAPTER 2

Contribute

- Documentation: https://github.com/decarlof/envirocells/tree/master/
- Issue Tracker: https://github.com/decarlof/envirocells/issues

Bibliography

[B1] Happy J and Unhappy J. The best furnace on earth. *Journal of Synchrotron Radiation*, 121(16):1224–1230, 2025.