

Major Chemistry Department Instrumentation*

Updated July 2024

* Additional instrumentation not included on this list that are managed by the Biology, Geosciences, ECBE, Mechanical Engineering and Physics and Astronomy Departments are also available.

Access is also available to the Union College MakerWeb, a group of five MakerSpaces spread across Union College campus that gives access to 3D printers, 360 Video and photography equipment, metal and woodworking equipment, LASER cutting lab, and CNC machine

Instrument	Number	Make	Model	Year of Acquisition	Location
Aerogel Fabrication Characterization and Application Laboratory					
Critical Point Dryer w/water circulator and heater/chiller	2	Energy Beam Sciences	E3100	2008	Wold 115
Gas Pycnometer	1	Micromeritics	AccuPyc 1330	2005	Wold 115
GC-MS (electron impact)	1	Hewlett-Packard	5890	1990	Wold 115
High Speed Camera Contact Angle Measuring System	1	Kruss	DSA100	2009	Wold 115
Hydraulic Hot Press, programmable	1	Tetrahedron Associates	MTP-20	2014	Wold 115
Hydraulic Press System, 24 ton, 14" x 14"	1	Tetrahedron Associates	MTP-14	2008	Wold 115
Material Testing Workstation	1	MTS	Insight 5	2008	Wold 115
Physisorption Analyzer, automatic	1	Micromeritics	ASAP 2020	2015	Wold 115
Physisorption Analyzer, automatic	1	Micromeritics	TriStar 3000	2008	Wold 115
Smart Prep Preparation Station for degassing samples	1	Micromeritics	SmartPrep	2008	Wold 115
Thermal Constants Analyzer	1	Hot Disk	HD-01	2003	Wold 115

Biochemistry					
Centrifuge	1	Eppendorf	5702R	2016	Wold 207
Centrifuge (vacuum) Concentrator	1	Eppendorf	Vacufuge Plus	2002	Wold 201
Coldroom (4°C, 9 ft x 8 ft)	1	Thermmax		2011	Wold 203
Fast Protein Liquid Chromatography (FLPC) System	1	Bio-Rad	NGC 10 QUEST	2014	Wold 209
Fraction Collectors	6	Bio-Rad	2110	2016	Wold 207
Freezer (-80°C)	1	Fisher	Isotemp	2012	Wold 210
Incubator	1	Fisher	Isotemp 5153	2011	Wold 204
Laminar Flow Hood	1	Labconco	Horizontal Clean Bench	2011	Wold 204
Lyophilizer	1	Labconco	4.5 L Freeze Drier	2014	ISEC 278
NanoDrop Spectrometer	1	ThermoScientific	NanoDrop 1	2021	Wold 210
PCR	1	Bio-Rad	iCycler	2004	Wold 201
PCR	1	Applied Biosciences	MiniAmps Plus		Wold 209
RT PCR	1	Applied Biosciences	QuantStudio 3	2020	Wold 210
PCR Cabinet	1	Labconco	Purifier	2011	Wold 207
Protein Electrophoresis Cells	5	Bio-Rad		2001	Wold 201
Shaker/Incubator (4 - 50 °C)	1	ThermoScientific	MaxQ 4000	2015	Wold 204
Water Polishing System	1	Elga	PureLab Ultra	2011	Wold 207
Western Blot Transfer Cell	1	Bio-Rad		2012	Wold 209

Cell Culture					
Biological Laminar Flow Hood (Class II, type A2, 4 ft)	1	ThermoScientific	1300 series	2011	Wold Biochem Suite
Cell Counter, automated	1	Invitrogen	Countess	2011	Wold Biochem Suite
Cell Counter, automated	1	Millipore	Scepter	2012	Wold Biochem Suite
Centrifuge (benchtop, refrigerated, with multiple rotors)	1	Sorvall	Legend ST16	2011	Wold 208
CO ₂ Incubator (water-jacketed, for mammalian cells)	1	Fisher	Isotemp	2011	Wold Biochem Suite

Light Microscope, inverted	1	Nikon	TMS	2011	Wold Biochem Suite
Light Microscope, compound	1	Nikon	Alphaphot YS-2T	2011	Wold Biochem Suite
Micro-osmometer, freezing-point depression	1	Advanced Instruments	Model 3300	used (1999) but purchased 2012	Wold 208

Chromatography, Separations, Mass Spectrometry					
GC-FID	2	Agilent	7890B	2015	Olin 205
GC-MS with autosampler with EI source, NIST 2017 library	1	Agilent	6890N/5973N	2003, software upgrade in 2016	ISEC 278
GC-MS with autosampler	1	Agilent	5977BMSD/8860 GC	2020	ISEC 278
HPLC, quaternary gradient HPLC with diode array UV/Vis detector, fluorescence detector, refractive index detector, and autosampler. Capable of both analytical and semi-prep scale purifications. ChromSword software available.	1	Agilent	1100	2003, Chemstation software update 2020	ISEC 278
ICP-MS with laser ablation unit (<i>access to instrument in the Geosciences</i>)	1	Agilent	8900	2017	Olin 331
Ion Chromatograph (<i>access to instrument in the Geosciences Department</i>)	1	Dionex	DX-500	1997	Olin 331
Ion Chromatograph (<i>access to instrument in the Geosciences Department</i>)	1	Dionex	ICS-2100	2010	Olin 331
LC-MS/MS, binary gradient HPLC with variable wavelength UV/Vis detector and autosampler; triple quadrupole mass spectrometer with ESI and APCI sources	1	Agilent	1200 series HPLC; 6410B MS	2009	Olin 005
Prep-Scale HPLC with UV/Vis Diode Array Detector and Fraction Collector	1	Shimadzu	LC-10	used (~2000) refurbished 2014	ISEC 278
Compact Mass Spectrometer with ESI and APCI sources. Sample introduction by direct injection, ASAP probe, and TLC plates	1	Advion	expression CMS	2024	ISEC 270
Flash chromatography system, liquid or dry-load, UV (200-400 nm) detection, flow up to 300 mL/min	1	Advion	puriFlash XS520Plus	2024	ISEC 278

Computational Chemistry					
Access to high performance computing on the <i>Hamilton College Cluster</i>		AMBER, GROMACS, Gaussian,			Hamilton College
Access to high performance computing cluster at Union College in the <i>Physics and Astronomy Department</i>		Gaussian, WebMO	Gaussian, WebMO	2022	ITS

Inorganic and Solid State Chemistry					
Box Furnace	1	Carbolite	CWF 11/13	1998	ISEC 262
Convection Oven	1	Carbolite	PF120	1998	ISEC 262
Magnetic Susceptibility Balance	2	Johnson-Matthey/Sherwood Scientific	MSB-Auto	2001, hardware update 2019	ISEC 283
Tube Furnace	1	Carbolite	HST 12/50/400	1998	ISEC 262

Multi-modal Systems					
TGA-FTIR-GCMS hyphenated system, for use as standalone TGA or in hyphenated mode for TGA-FTIR, TGA-FTIR-MS, TGA-FTIR-GCMS, TGA-MS, TGA-GCMS. Components below:					
TGA	1	PerkinElmer	TGA 8000	2024	ISEC 270
FTIR/NIR Spectrometer with "zero gravity" gas chamber			Spectrum 3		
GCMS with EI source and single quadrupole detector			GC2400 / MS 2400SQ T		

Electrochemistry					
Voltammetric Analyzer	1	PAR	VersaSTAT3	2009	ISEC 270

Physical Chemistry					
Argon-Krypton Mixed Gas Ion Laser	1	Coherent Inc	Innova 70C Spectrum	2015	Olin 005C
Bomb Calorimeter	1	Parr Instrument Company	6200EA	2014	ISEC 270
Differential Scanning Calorimeter with RCS90 and FACS accessories	1	TA Instruments	DSC25	2020	ISEC 270
Micro-Osmometer	1	Advanced Instruments	Model 3300	2012 (used)	ISEC 252
Monochromator/CCD Detector	1	Andor	SR303	2014	Olin 005C
Polarimeter	1	Rudolph	Autopol III	2016	ISEC 270

Spectroscopy					
Atomic Absorption Spectrometer	1	Perkin-Elmer	3100	1992	ISEC 270
Circular Dichroism Spectropolarimeter	1	Jasco	J-1500	2021	ISEC 270
Dynamic Light Scattering Instrument	1	Malvern	ZetaSizer Ultra Red	2022	ISEC 270
Fluorometer	1	PTI	QuantaMaster	1998	ISEC 270
Fluorometer with phosphorescence system and nitrogen-pumped dye laser for time-resolved measurements	1	PTI	TimeMaster C-700	2003, 2005	ISEC 270
FTIR	1	Thermolectron	IR 200	2007	Olin 205
FTIR w/ Diamond Anvil ATR	2	Thermolectron	iS5, iD7 (ATR)	2016/2020 (ATR)	ISEC 278/270
NMR (400 MHz, with variable temperature, broadband and inverse multinuclear probes)	1	Bruker	Avance III	2010	ISEC 278
Raman Spectrometer	1	DeltaNu	Advantage 633	2009	ISEC 270
UV/Vis Diode-Array Spectrophotometer with kinetics software	3	Agilent	8453	2010	ISEC 270/278
UV/Vis Diode-Array Spectrophotometer with kinetics software	2	Agilent	8454	2015	ISEC 270, Olin 205
UV/Vis Microplate Reader	1	Molecular Devices	SpectraMax 190	2009	Wold 210
UV/Vis/Fluorescence Microplate Reader	1	Molecular Devices	SpectraMax M5	2020	Wold 210
UV/Vis/Fluorescence Microplate Reader	1	Molecular Devices	SpectraMax iD3	2017	Wold 210
UV/VIS/NIR dual monochromator spectrophotometer	1	Perkin-Elmer	Lambda 900	2003, software update 2021	ISEC 270

Surface Science					
Atomic Force Microscope (w/ inverted optical microscope)	1	Asylum	MFP-3D-SA	2009	Olin 005
Infrared Microscope	1	Bruker	Tensor	2009	Olin 005
Raman Microscope	1	Bruker	Senterra	2009	Olin 005
Scanning Electron Microscope with EDX	1	Zeiss (EDX is Bruker)	EVO	2015	Olin 005
X-Ray Diffractometer	1	Rigaku	Smartlab	2015	Olin 005

Other Specialized Equipment					
Glove Box with freezer	1	MBraun	UNIlab	2002	ISEC 278
Microwave Synthesizer	1	Milestone	Start Synth	2013	ISEC 278
Solar Simulator	1	Atlas Materials Testing	Suntest XLS+	2006	ISEC 262
Water Polisher	1	Evoqua	Purelab Ultra Analytic	2020	ISEC 252
Nitrogen generator	1	Peak Scientific	Genius 1053	2024	ISEC 278 (ISEC 270)