

ISMS

This is a list of the components needed to build the quadrupole mass spectrometer that is at the core of the *in situ* mass spectrometer (ISMS). This list is largely comprehensive, but does not include materials or supplies that are commonly found in engineering or scientific laboratories, e.g. soldering irons, wiring harnesses, etc. In addition, recent iterations of the ISMS involve housing environmental sensors, etc that are not represented in this list. We are happy to share these technologies, but did not include them as they are not required for instrument operation.

Also, we have avoided listing prices as they do vary over time. However, this instrument as shown here is likely to cost ~\$15,000 USD or less. This does not include the cost of the housing, which again is not represented in this list as most investigators outsource the fabrication of housings to commercial vendors such as KUM in Germany.

Finally, we encourage you all to contact us prior to embarking on this fabrication, as we are happy to provide you with guidance on order of operations in assembly and other "best practices" in instrument fabrication. You may contact Prof. Peter Garguis at pgarguis@oeb.harvard.edu as well as Dr. Charles Vidoudez at charlesvidoudez@gmail.com

	Component description	Product ID	Options, etc	Number	Manufacturer
MS	Quadrupole mass spectrometer	RGA200		1	SRS (Stanford Research Systems)
	Electron multiplier			1	SRS (Stanford Research Systems)
Vacuum	Turbomolecular pump with CF450 port	HiPace80		1	Pfeifer
	Roughing pump	N84.3 with brushless motor		1	KNF
Vacuum/ ionisation chamber	Vacuum chamber with side port	275DXSP12		1	A&N corp.
	Vacuum chamber extension	275-150-D		2	A&N corp.
	zero length adapter cf 450 to 275	450x275-150-0-T1vx		3	A&N corp.
	cf 275 copper orings	275-CG			A&N corp.
	cf 450 copper orings	450-CG			A&N corp.
	Silver-Plated Bolts, 12-Point Head, for 2.75" OD CF Flanges, (D=1/4", L=2.125", Thread: 28 Per Inch for 1.25") - with Hex Nuts & Washers, pack of 25	SBN-28-212		1	Duniway stockroom
	Silver Plated Metric Bolts, Hex Head, for 4.00" or 6.00" OD CF Flanges, (D=8 mm, L=55 mm, Thread Pitch: 1.25 mm) - with Hex Nuts & Washers	SMN-M8-55		1	Duniway stockroom
1/8 male NPT to 1/8 swage	SS-200-1-2		1	Swagelok	
Misc	Dessicant	2228K6		1	McMaster
Power	24V DC isolator and conditonners	VHB350-D24-S24	102-2378-ND	2	digikay
Internal frame	See drawings			1	home made
Inlet	0.500x0.062 inches, in 316L SS, 2 micron, support disc			10	applied porous
	PDMS membrane			1	Franatech
	SAE fitting	SS-200-1-2ST		1	Swagelok
	1/4 npt to 1/4 swage	SS-400-1-4BT		1	Swagelok
	1/4 swage 1/4 swage 1/4 npt T	SS-400-3-4TMT		1	Swagelok
Seabird pump	seawater (CTD) pump	SBE 5T, Ti housing, continous duty		1	Seabird electronic
	pump cable	17133		1	Seabird electronic
Connectors	from ISMS to external componds	MCBH16F-Ti and MCIL16M		2	Subconn
Sampling	Cooling coil, 3m, Ti 1/4	89835K61		2	McMaster
	teflon tubing, ft	52355K33		20	McMaster