Department of Applied Chemistry

Instruments: Specifications and Justification

1. Rotary evaporator equipped with chiller

(a) Specifications

Type of cooling	Vertical
Cooling surface	Approximately 1500 cm2
Speed range	20 - 280 rpm (normal range)
Reversible direction of rotation	Needed
Lift	With Motor
Heating temperature range	Room temp. to 180 °C
Set temperature resolution	1 ±K
Vacuum controller integrated	Not needed
Permissible ambient temperature	5 - 40 °C (normal range)
Voltage	220 - 240 / 115 / 100 - 240 / 100 - 120 / 100 - 115 V (Should work in this voltage range)
Frequency	50/60 Hz

(b) **Justification**: Rotary evaporator is extremely helpful for evaporation of solvents from compounds synthesized in laboratory at low temperature, especially for those chemical entities which have low melting points and are sensitive in nature. The instrument will be useful for project students as industrial point of view.

(c) **Warranty**: 5 years except breakable part
AMC: 10% of the total cost, 1st year
15% of the total cost, 2nd year
20% of the total cost, 3rd year

2. Water Chiller

(a) Specifications

Temperature range	-10 °C ~ 35 °C
Temperature stability	±0,3 °C
Cooling capacity	500 Watts
Pump power	25 Watts
Pump type	Mechanical

(b) **Justification**: Water chiller works with rotary evaporator without chiller rotary evaporator is of no use. Low boiling solvents under reduced pressure condensed with the help of chiller in specified temperature range.

(c) **Warranty:** one year

AMC: 10% of the total cost, 1st year
15% of the total cost, 2nd year
20% of the total cost, 3rd year

3. **High Vacuum Pump**
   (a) Specifications

Nominal pumping speed	m^3/hr	6
	cfm	3.5
	L/min	100
Ultimate pressure	Gas Ballast Closed - mbar (Torr)	$1x10^{-3}$ ($7.5x10^{-4}$)
	Gas Ballast Open - mbar (Torr)	$6x10^{-2}$ ($4.5x10^{-2}$)
Pump rotational speed at no-load	rpm	1440
Maximum nominal power rating	kW	0.25
	Phase	1 or 3
	Power supply	230V ± 10%; 50Hz ± 5% for Single Phase 410V ± 10%; 50Hz ± 5% for Three Phase
Oil capacity	Litres	2
Must work with Oil		HHVP Molecular Distilled Oil : Grade MD-504

(b) Justification: The synthesis always accompanied high boiling solvents such as DMF and Toluene and the removal at low vacuum is never possible at normal and high temperatures. These solvents only can be removed with the help of high vacuum pumps along with the use of rotary evaporator.

(c) Warranty: one year

AMC: 10% of the total cost, 1st year
15% of the total cost, 2nd year
20% of the total cost, 3rd year