

**CSIR-Indian Institute of Petroleum, Dehradun**

**List of Equipments prioritized for purchase during FY 2022-23 for B/H P-50**

<b>Sl. No.</b>	<b>Name of Equipment</b>	<b>Estimated cost Rs ( lakh)</b>
1.	Nitrogen Generator	10
2.	Mass Based Quantitative Online Real-time Gas and Vapor Mixture Analyzer	50
3.	Lovibond Tintometer for measurement of the color of Paraffin Wax as per BIS standard IS 4654 (1993)	7
4.	Glove Box	24.5
5.	Electrochemical Workstation	12
6.	Fused Deposition Modelling 3D Printer	15
7.	GC-TOGA (ASTM D3612 Method C	55
8.	Microwave Digester	35
9.	ASTM D86 (Automatic)	30
10.	Double Beam UV Spectrometer	08
11.	Karl Fisher Titrator for Moisture Analysis	5
12.	Gas Chromatograph-FID	25
13.	Multiple Unit Filter Press API (LPLT)	10
14.	EP / Lubricity Tester	20
15.	Core Flooding system	15
16.	Chemisorption (TPR/TPD) analyser	85
17.	Automatic ASTM D86 Distillation unit	15
18.	PONA Detailed Hydrocarbon Analysis/Application kit:	11
19.	Automatic Potentiometric Titrator	12
20.	FT-IR with Diffuse reflectance accessories	35
21.	Chemisorption analyzer	45
22.	On-line and Offline Gas Analyzer for CO, CO <sub>2</sub> , O <sub>2</sub> , C <sub>2</sub> -C <sub>5</sub> Hydrocarbons and its isomers including BTX quanta	35
23.	Gas analyser for C <sub>1</sub> -C <sub>6</sub> , with isomer separation	32

**List of Equipments prioritized for purchase during FY 2022-23 subjected to availability of funds under B/H P-50**

Sl. No.	Name of Equipment	Estimated cost Rs ( lakh)
1.	Fixed Bed Hydroprocessing unit for heavy oil and residue	98
2.	RGA (GC)	40
3.	Upgradation of Metrohm Autotitrator	15
4.	Air Receiver Tank and Filters of Air Compressor	06.00
5.	Heat Treatment accessories for high temperature Tribometer	10.00
6.	DEFORM Software (perpetual license)	20.00
7.	Automatic Flashpoint Abel IP 170	15.00
8.	Customized GC-FID	20.00
9.	HPLC with RI and ELSD detectors	40.00
10.	Customized GC with FID and MS Detectors with DHA software	65.00
11.	Weighing balance, hot plate with Stirrer, TLC, Melting point apparatus, and minor equipment	10
12.	HPLC-UVVIS-ELSD Detectors (ASTM D5837)	40
13.	Flash Point Abel (Automatic)	15
14.	Refractive Index	12
15.	Flurometer	5
16.	Benchtop XRD	65
17.	Bench Top NMR (80MHZ/100MHZ)	80
18.	Customized HCs analyser/Gas analyzer with FID and TCD	48
19.	Chemisorption analyser	45
20.	ATS tubular furnace	7
21.	Customized on-line gas analyzer	34
22.	H <sub>2</sub> Generator (10 L/min)	8
23.	N <sub>2</sub> Generator (10 L/min)	8
24.	Fixed bed reactor	80.00
25.	Distillation setup with vacuum pump	10.00
26.	Nitrogen generator	10.00
27.	Three-zone split furnace	6.00
28.	Parr reactor	35.00
29.	Lab-scale pyrolysis reactor	15.00
30.	Mass Flow Controllers	5.00
31.	Fermenter refurbishing and servicing	8.00
32.	Tabletop Rota vacuum evaporator with water circulating bath (Chiller) and vacuum pump (complete set up)	10.00
33.	HPLC service and accessories	6.00
34.	Particle measurement system and Ultra micro balance	190.00
35.	Dyno control system upgradation with test cycles.	85.00
36.	Simultaneous measurement system for NO and NO <sub>2</sub> measurement	25.00
37.	EV Motors & motor controllers, Accessories, SOC Display, Li-ion batteries , charging systems (charger/station)	8.00
38.	UPGRADATIO OF AMA/CVS to WIN. 10	15.00
39.	Emission analyser software Upgradation of Chassis Lab	14.00
40.	Gasoline Engine Test Bed with Dynamometer	14.00
41.	Portable 5- Gas Analyser	5.00

42.	Engine dyno test beds	40.00
43.	BS VI Two Wheeler	2.00
44.	Particle size analyzer, TAN apparatus	5.00
45.	Stirrer for degumming	10.00
46.	Rota vapour	6.00
47.	Spares for Distillation column (vacuum pump), Three parallel reactors.	20.00
48.	Spares of Existing Equipment, Pilot plant spare, Gas meter	24.00
49.	Total polar organic component	5.00
50.	Vacuum pump	10.00
51.	Batch distillation column	7.00
52.	Pre-heater	20.000
53.	De-ionization water Unit	20.00
54.	Pulley and loading unloading system	5.00
55.	Barrel pumps and transfer pumps	5.00
56.	Rotating cage autoclave assembly for corrosion testing	20.00
57.	Polymerization reactor	12.00
58.	Lab scale flow loop	15.00
59.	Air compressor with dryer	8.00
60.	Optical tensiometer that measures static and dynamic contact angles, static and semi-dynamic surface/interfacial tension and surface free energy:	12.00
61.	Optical microscope with plane polarized light	20.00
62.	Recirculating Cooler (Chiller) with PID controller to adjust the temperature profile-04 Nos	15.00
63.	High pressure Syringe pump-500D with flow rates up to 200 mL/min at pressures up to 3,750 psi (259 bar) and 500 mL cylinder capacity	20.00
64.	N2 generator and zero air generator	10.00
65.	Quadruple Mass Spectrometry (QMS) based online gas analyzer	55.0
66.	Portable Biogas Analyzer CH <sub>4</sub> : 0-100%; CO <sub>2</sub> : 0-100%; H <sub>2</sub> S: 0-5000 ppm; O <sub>2</sub> : 0-25%	8.0
67.	COMSOL Multiphysics software with Perpetual license and support	11
68.	Chiller ( -30 -100°C)	6
69.	Circulating water bath (5 -250 °C)	5
70.	Vapor Liquid Equilibrium data generation apparatus	30
71.	Densitometer	7
72.	Audio system for auditorium	35
73.	Battery Bank of 90KVA UPS [42 batteries]	7
74.	Universal Calibrator	6
75.	Flow Calibrator (5ml/min - 500ml/min)	4
76.	Lathe Machine	24
77.	Milling Machine	24

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