High Performance Liquid Chromatography (HPLC)

Brand: SHIMADZU

Model: Nexera LC-40D XR

Location: K637 Room, 6th Floor, Chaloemprakiet Building, Phyathai Campus

Custodian: PRADUP MESAWAT

Specifications:

System Controller: CBM40

Description	Specification
Monitor	LabSolutions, Web monitor
Connectable unit	Solvent delivery unit: Max. 4, Autosampler: 1, Column oven: Max. 4, Detector: Max. 2, etc.
Number of connectable units	8 (Using option: 12)
Operating temperature range	4 to 35°C

Degassing Unit: DGU-405

Description	Specification
Number of degassed solvents	5
Degassed flow line capacity	400 µL/1 line
Operating temperature range	4 to 35°C

Solvent Delivery Pump: LC-40D XR

Description	Specification
Pumping method	Parallel-type double plunger (approx. 10 µL/1 stroke)
Allowable maximum pressure	70 MPa
Flow rate settings range	0.0001 – 3.0000 mL/min (1.0 – 70 MPa) 3.0001 – 5.0000 mL/min (1.0 – 44 MPa) 5.0001 – 10.0000 mL/min (1.0 – 22 MPa)
Flow rate accuracy	≤ ± 1% or ± 2 µL/min, whichever greater (under specied conditions)
Flow rate precision	≤ 0.06% RSD or 0.02 min SD, whichever greater
Gradient mode	Quaternary low-pressure gradient (Only available for LC-40D XR)
Gradient range of set concentrations	0 to 100% (0.1% step)
Gradient concentration accuracy	± 0.5% (under specied conditions)
Available pH range	1 to 14
Automatic rinsing kit	Standard equipment
Degassing unit	LC-40B XR: 2 units connectable
Operating temperature range	4 to 35°C

Autosampler: SIL-40C XR

Description	Specification
Injection method	Total-volume Injection (standard), loop injection (optional)
Allowable maximum pressure	80 MPa
Injection volume	0.01 to 50 µL
Injection volume accuracy	≤ ± 1% (5 µL injection, n = 20)
Linearity	≥ 0.9999
Injection cycle time	≤ 6.7 seconds
Samples for processing	162 (1.5 mL sample vial, 54 × 3 plates)
Injection volume reproducibility	RSD ≤ 1.0% (0.5 to 0.9 µL), RSD ≤ 0.5% (1.0 to 1.9 µL), RSD ≤ 0.25% (2.0 to 4.9 µL), RSD ≤ 0.15% (More than 5.0 µL), RSD < 0.5% (typically, 0.5 µL), RSD < 0.25% (typically, 1.0 µL)
Carryover	≤ 0.0015% (without rinse) ≤ 0.0003% (with rinse, typically)
Sample cooler	SIL-40C XR: Standard equipment (Air-circulation temperature control type)
Sample cooler temperature setting range	4 to 45°C (Room temperature needs to be less than 30°C and humidity needs to be less than 70% to set 4°C)
Sample cooler temperature accuracy	± 2°C (sensor position ± 0.5°C)
Available pH range	1 to 14
Operating temperature range	4 to 35°C

Column Oven: CTO-40C

Description	Specification
Temperature control type	Forced air circulation
Cooling Method	Electronic cooling
Temperature control range	Room temperature – 10°C to 100°C
Temperature accuracy	± 0.5°C
Temperature precision	± 0.05°C
Containable column size and number	Up to 250 mm L. column × 6 or 300 mm L. column × 3
Operating temperature range	4 to 35°C

Fraction Corrector: FRC-10A

Description	Specification
Number of ports	16 to 144 depending on test tube rack used (Selectable with parameter settings)
Fractionating system	Fractionation with valve (fractionation head with valve) or with nozzle directly (fractionation head without valve)
Maximum flow rate	150 ml/min (Hexane) varies depending on the fractionation head specification or mobile phase type)
Fractionation mode	Set by combination of basic mode (initial parameter mode) + time program mode (16 functions)
Condition Settings and Execution	Time programs, Volume/ Delay time parameters, Peak detection
Operating temperature	4 °C to 35 °C
Rack	Sample cooler L (50 fractions)
Collection containers	Vial (glass) 4 mL, Vial (PP) 5 mL

Sampler cooler

Description	Specification
System	Cooling and heating of aluminum block with peltier elements
Temperature set range	4 °C to 70 °C
Temperature control precision	±0.2 °C (temperature in 4 mL vial) (when setting 4 °C in room temperature of 27 °C)
Temperature setting accuracy	Within the larger value of ±1 °C or set temperature ±5 %
Operating temperature	5 °C to 30 °C

Photodiode Array Detector (PDA): SPD-M40

Description	Specification
Light source	Deuterium (D_2) lamp
Number of diode elements	190 to 700 nm
Wavelength range	8 nm
Wavelength accuracy	≤ ± 1 nm
Wavelength reproducibility	≤ ± 0.1 nm
Slit width	≤ 0.1 × 10−3 of AU/h (under specied conditions)
Spectral resolution	≤ ± 1.4 nm
Drift	≤ 0.4 × 10^{-3} of AU/h (under specied conditions)
Noise	≤ 4.5 × 10^{-6} AU (under specied conditions)
Linearity	2.5 AU (under specied conditions)
Standard flow cell	Optical path length: 10 mm, Cell volume: 12 µL, Pressure: 12 MPa
Sampling rate	Max. 100 Hz
Cell temperature control range	19 to 50°C, 1°C Step
Available pH range	1 to 13 (Cell quartz might be damaged by a mobile phase pH >10.)
Operating temperature range	4 to 35°C

Spectrofluorometric Detector: RF-20A

Description	Specification
Light source	Xenon lamp
Wavelength range	200 to 650 nm
Spectral bandwidth	20 nm
Wavelength accuracy	± 2 nm
Wavelength precision	± 0.2 nm
S/N	Water Raman peak S/N ≥1200 Low background S/N ≥ 9000
Range of cell temperature control	40°C
Cell	Standard conventional cell: volume 12 µL, maximum pressure 2 MPa
Sampling rate	Max. 100 Hz (Single wavelength mode)
Function	Simultaneous measurement of four wavelengths, Wavelength scanning
Operating temperature range	4 to 35°C

Evaporative Light-Scattering Detector: ELSD LT III

Description	Specification
Nebulizing method	Siphon Splitting
Light source	1.6 W High Power Laser (450 nm) Standard replacement time: 5000 hours
Detection element	Photodiode
Evaporation temperature set range	Room temperature –100°C
Drift tube temperature	Room temperature –100°C
Gas nebulizer	Nitrogen
Gas consumption	3 L/min (max)
Mobile phase flow rate range	0.2 to 2.0 mL/min
Nebulizer-Generated Back Pressure for Water (MPa)	0.2 or Less (1 mL/min)
Supply gas pressure	300 – 450 kPa (4.32-65.2 psi), Standard setting: 350 kPa
Sampling rate	Up to 100 Hz
Operating temperature range	4 to 35°C
Operation humidity range	20 to 85%