High-Performance Liquid Chromatography (HPLC) (Make: THERMO)

- The Thermo Scientific Vanquish HPLC system is an advanced analytical instrument used for the separation, identification, and quantification of chemical compounds in complex mixtures.
- It consists of two detector- RI and UV-Visible which detect separated compounds based on their absorbance or spectral properties.
- Pump Module: Delivers mobile phase at constant flow and high pressure; supports binary or quaternary gradient elution.
- Column Compartment (Oven): Maintains a stable temperature for consistent retention and peak shape.

Instrument Capabilities

- Pressure Range: Supports up to 1500 bar (≈22,000 psi), allowing use of sub-2 µm particle columns.
- Flow Range: Typically, 0.001–8.0 mL/min, depending on configuration.
- Column- C18 and Amino
- Software: Controlled via Thermo Scientific Chromeleon™ Chromatography Data System (CDS) software.

Sample Type

- Protein and enzymes
- Microbial metabolites
- Pharmaceutical products

Sample Preparation

- As per user requirements

Applications

- Enables separation, identification, and quantification of complex mixtures.
- Pharmaceutical analysis – quantification of active ingredients, impurities, and degradation products.
- Metabolomics and lipidomics – profiling of metabolites, lipids, and small biomolecules.
- Food and beverage testing – analysis of vitamins, additives, preservatives, and contaminants.
- Polymer and material science – characterization of polymers, additives, and degradation products.

References

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- Beech, J. L., Clare, R., Kincannon, W. M., Erickson, E., McGeehan, J. E., Beckham, G. T., & DuBois, J. L. (2022). A flexible kinetic assay efficiently sorts prospective biocatalysts for PET plastic subunit hydrolysis. *RSC advances*, *12*(13), 8119-8130.