Ion Chromatography System

(Environmental Research Laboratory)

Name of the Instrument:	Ion Chromatography System (IC)
BSIP Instrument Code:	BSIP/SAIF/027
I-Stem Equipment code	961331
Make:	Metrohm
Model:	Eco IC 925
Year of Installation:	2026

Unit In-charge: Dr Anupam Sharma (anupam.sharma@bsip.res.in, Contact: 0522-2742974)

Scientist In-charge of Instrument: Dr Anurag Kumar (anuragkumar@bsip.res.in)

Facilities under the lab: All additional instruments necessary for sample processing.

Specification: Metrohm 925 Eco IC is a compact ion chromatograph for routine anion and cation analysis in water samples, featuring suppressed conductivity detection, simple operation, low maintenance, and reliable performance. Pump type: Resolution of flow: 0.001mL to 20 mL/min, Pressure range: 0–5000 PSI. Detector type: Microprocessor based Suppressed Conductivity Detector, Conductivity Range: 0–1500 µS/cm. Suppressor type: Chemical Suppressor for Anion. Injector type: Dual position 6-Port injector valve.

Anion Column: Metrosep A Supp 5, 250/4.0

Cation Column: Metrosep C6, 150/4.0

Autosampler capacity: 36 positions, Sample volume range: 0.5 - 11mL. Data Processor: PC–based system controlled through software. Software: MagIC Net. Standards: NIST certified standard for cation and anion.

Performance: Capable of simultaneous determination of multiple cation and anion, automated operation for continuous sampling analysis.

Working Principle: The Metrohm ECO IC 925 Ion Chromatography system works on the principle of ion-exchange chromatography for the separation and quantification of dissolved ionic species in aqueous samples. The sample is injected into a flowing eluent stream and transported through an ion-exchange analytical column containing a stationary phase. Different ions interact with the stationary phase to varying degrees and are therefore separated based on their charge and affinity. As the separated ions elute from the column, they pass through a conductivity detector, which measures their electrical conductivity. The detector generates chromatographic peaks whose retention times identify the ions and whose peak areas determine their concentrations. This system is widely used for the determination of major inorganic ions such as F^-, Cl^-, NO_3^-, SO_4^{2-}, PO_4^{3-}, Na^+, K^+, Ca^{2+} and Mg^{2+} in environmental, drinking and groundwater samples.

Application: The Metrohm ECO IC 925 is widely used for the qualitative and quantitative analysis of inorganic ions in various sample matrices. It is extensively employed in environmental studies for monitoring water quality by determining major anions and cations such as fluoride, chloride, nitrate, sulfate, sodium, potassium, calcium and magnesium in surface water, groundwater, rainwater and wastewater samples. The system is also used in hydrological and geochemical investigations, drinking water quality assessment, industrial process control, food and beverage analysis and pharmaceutical applications. Its high sensitivity, accuracy and reliability make it an essential tool for routine laboratory analysis and research studies.

Guideline for sample preparation and courier: For the determination of cations and anions, water samples should be filtered immediately in the field using a 0.45 µm nylon membrane filter and collected in separate 30 mL airtight sample bottles designated for cation and anion analyses. The bottles should be filled completely, leaving no headspace, to minimize atmospheric interaction and preserve sample integrity. Samples intended for cation analysis should be preserved by adding 200-300 µL of concentrated nitric acid (HNO_3) to 30 mL bottle, ensuring that the sample pH is reduced to below 2. Acidification prevents the precipitation of dissolved metals and cations, thereby maintaining their original concentrations until analysis.

All samples should be securely sealed, appropriately labeled and carefully packed to prevent contamination, evaporation or leakage during storage and transportation. Each sample bottle should be clearly identified with the sample code, sampling location, date and time of collection. Proper labeling and documentation are essential for ensuring sample traceability, maintaining data quality and facilitating accurate interpretation of analytical results.

Samples should be securely packaged and delivered to the address provided below.

Address: Dr Anurag Kumar
Scientist
Birbal Sahni Institute of Palaeosciences, Lucknow
53 University Road
City: Lucknow
State: Uttar Pradesh
Pin: 741246

User instructions:

1. The analytical data/spectra provided cannot be used as certificates in legal disputes.
2. Service charges (including GST) will be payable in advance through BSIP online payment portal or through Draft/RTGS/NEFT in favour of "The Director, BSIP, Lucknow", Payable at Lucknow.
3. Separate samples should be sent for different analysis. Samples will not be analysed until payment is received.
4. In case of prepared samples, the user must specify the procedure that how the sample was prepared (complete methodology).
5. In all correspondence related to analysis, our reference number must be mentioned.
6. Interpretation of data/spectra will NOT be done.
7. It is mandatory for users to acknowledge the facility in their research work and inform the respective laboratory and the Director of BSIP, Lucknow. This information will be communicated onward to DST, New Delhi.
8. For Lab visit, it is mandatory to take prior appointment. The application should be sent to the BSIP director and unit in-charge.

Payment Guidelines: Payment should be done through online payment portal of BSIP or through bank draft in favour of "Director, Birbal Sahni Institute of Palaeosciences". Please visit our web-site for updated rate-List. Please mention the instrument code in remarks at the time of payment. The payment confirmation must be sent to concerned scientists along with the copy performa invoice.