REPORT OF
Two Days Workshop
On
"Hands-on Training on ICP-MS Instrumentation Techniques & Data analysis"

Organized on: 4 & 5th April, 2025

SCHOOL OF PHARMACY

GUJARAT TECHNOLOGICAL UNIVERSITY

Coordinator : Mr. Ravi Patel

Schedule for Two-Day Hands-on Training Program on ICP-MS Instrumentation & Data Analysis

04th April 2025, Friday

TIME	Sessions
10:30 AM– 11:00 AM	**Registration & Breakfast**
11:00 AM– 11:15 AM	**Welcome Address**
11:15 AM – 01:00 PM	**Session 1: Introduction to ICP-MS, Instrumentation and Optimization** • Overview of ICP-MS: Principles and Applications • Advantages of ICP-MS over other techniques (AAS, ICP-OES) • Sample Types and Preparation Techniques • ICP-MS Components: Plasma Torch, Interface, Quadrupole, Detector • Sample Introduction System and Ionization Process • Interference in ICP-MS: Matrix, Isobaric, and Spectral Interferences • Strategies for Minimizing Interferences (Collision/Reaction Cell Technology)
01:00 PM – 02:00 PM	**Lunch Break**
02:00 PM – 03:30 PM	**Session 2: ICH Q3D Implementation & Risk Assessment for Elemental Impurities** • Introduction to ICH Q3D Guidelines on Elemental Impurities • ICH Q3D Risk Assessment Approaches • Elemental Impurities Classification and Permitted Daily Exposure (PDE) Limits • Analytical Techniques for Elemental Impurities Testing • Case Studies: ICP-MS Application in ICH Q3D Compliance
03:30 PM – 03:45 PM	**Tea Break**
03:45 PM – 05:00 PM	**Session 3: Practical Demonstration - Instrument Operation & Sample Introduction** • Instrument Startup and Optimization • Plasma Generation and Tuning Parameters • Standard and Sample Introduction Procedures

Schedule for Two-Day Hands-on Training Program on ICP-MS Instrumentation & Data Analysis

05th April 2025, Saturday

TIME	Sessions
10:30 AM– 11:00 AM	**Breakfast**
11:00 AM – 01:00 PM	**Session 1: Hands-on Training – Calibration and Standard Preparation** • Preparation of Calibration Standards • Microwave assisted digestion for sample preparation • Method development and Optimization
01:00 PM – 02:00 PM	**Lunch Break**
02:00 PM – 03:30 PM	**Session 2: Hands-on Training –Sample analysis and Interference Correction** • Real Sample Analysis (Pharmaceuticals, Water, Soil, Food, etc.) • Interference Removal Using Collision/Reaction Cell • Data Interpretation: Mass Spectra & Signal Intensity • ICH Q3D Reporting and Compliance Documentation
03:30 PM – 03:45 PM	**Tea Break**
03:45 PM – 04:00 PM	**Vote of Thanks & Feedback**

Preamble:

The School of Pharmacy, Gujarat Technological University (GTU), organized a comprehensive two-day hands-on training program on **ICP-MS Instrumentation and Data Analysis** on **4 & 5th April, 2025**. The event was designed to bridge the gap between theoretical knowledge and practical applications of Inductively Coupled Plasma Mass Spectrometry (ICP-MS) in pharmaceutical and environmental analysis. A total of **eleven participants** attended the program, representing a diverse mix of backgrounds including **academia, industry, PhD scholars, and postgraduate students**, thereby contributing to a rich and collaborative learning environment. The workshop was part of GTU's ongoing commitment to providing industry-relevant exposure through expert-led training sessions aimed at fostering skill development and knowledge enhancement.

Objectives:

- To provide participants with an in-depth understanding of ICP-MS instrumentation and its analytical capabilities.
- To impart knowledge on ICH Q3D guidelines for elemental impurities and their practical implementation.
- To offer hands-on training in sample preparation, calibration, standardization, and data interpretation.
- To create a collaborative learning environment involving academia, industry experts, and young researchers.

Details of Activities

Day 1: April 4, 2025 (Friday)

- **Session 1:** *Introduction to ICP-MS, Instrumentation, and Optimization*
  Expert: Mr. Saroj Mataprasad (Application Scientist, Thermo Fisher)

Covered principles of ICP-MS, component overview, interference types, and strategies for their reduction.

- **Session 2:** *ICH Q3D Implementation & Risk Assessment for Elemental Impurities*
  Expert: Mr. Ravisinh Solanki (Assistant Professor, GTU-SP)
  Focused on regulatory aspects, risk assessment approaches, analytical techniques, and real-world case studies.
- **Session 3:** *Demonstration - Instrument Operation & Sample Introduction*
  Expert: Mr. Ravi Patel (Assistant Professor, GTU-SP)
  Included instrument startup, plasma tuning, and sample handling procedures.

Day 2: April 5, 2025 (Saturday)

- **Session 1:** *Hands-on Training – Calibration and Standard Preparation*
  Expert: Mr. Saroj Mataprasad
  Participants learned standard preparation techniques, microwave digestion, and method development.
- **Session 2:** *Hands-on Training – Sample Analysis and Interference Correction*
  Expert: Mr. Saroj Mataprasad
  Focused on real sample analysis, interference removal via collision/reaction cells, and data interpretation.

Outcomes:

The two-day training program yielded several significant outcomes. Participants developed a strong conceptual and practical understanding of ICP-MS instrumentation, including its application in regulatory frameworks such as ICH Q3D for elemental impurities. The hands-on sessions enhanced their skills in calibration, standard preparation, sample analysis, and data interpretation, thereby bridging the gap between theory and real-world applications. The event also fostered interdisciplinary interaction among the eleven attendees, who came from diverse backgrounds including academia, industry, PhD research, and postgraduate studies. This diversity enriched the learning environment and encouraged knowledge exchange. Additionally, the expert-led sessions provided participants with valuable insights into current industry practices and regulatory expectations, promoting a deeper appreciation of analytical instrumentation in pharmaceutical and environmental testing contexts.

Event Photo:


GPS Map Camera
Gandhinagar, Gujarat, India
E/1/1, Sector 26, Gandhinagar, Gujarat 382028, India
Lat 23.253368° Long 72.636182°
04/04/2025 11:15 AM GMT +05:30
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GPS Map Camera
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