Report on One-Day Visit to Anchrom Enterprises for Training on HPTLC

At

Anchrom Enterprises Pvt. Ltd.

A-101, Shree Aniket Apartments, Navghar Rd, Mulund East, Mumbai, Maharashtra 400081





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Date	04/01/2025
Coordinator from college	Dr. Pintu Prajapati
Approved by	Dr. Shailesh Shah, Principal
Participating student	15 students of Fourth semester(Pharmaceutical
	Quality Assurance)
Accompanying faculty member	Mr. Praful Dedhiya
Coordinators from Anchrom	Mrs. Vedika Patil
	(Application Analyst)
	Mr. Ritvik Singh
	(Application Analyst)

Introduction

On January 4, 2025, as part of my academic program in the second year of Master of Pharmacy (M.Pharm), I had the opportunity to visit Anchrom Enterprises, Mumbai, for a one-day training session on High-Performance Thin Layer Chromatography (HPTLC). This visit was organized to provide hands-on training and a deeper theoretical understanding of HPTLC, an advanced chromatographic technique widely used in pharmaceutical and analytical research.

This report outlines the objectives, activities, and key learnings from this enriching training session.

Objectives of the Visit

The training session aimed to achieve the following objectives:

- 1. To provide exposure to HPTLC as a vital analytical tool in pharmaceutical research.
- 2. To understand the principles and instrumentation of HPTLC in-depth.
- 3. To interact with experts in the field, clarify doubts, and explore the latest advancements in HPTLC technology.

Schedule and Sessions:

The day-long training session was well-structured, consisting of a theoretical learning and handson demonstrations. The schedule included the following sessions:

Morning Session: Theoretical Overview

The morning began with a theoretical session where the trainers introduced participants to the basics of HPTLC.

1. Introduction to HPTLC:

The training commenced with an overview of HPTLC, presented by the expert trainers at Anchrom Enterprises. The participants were introduced to the basic concepts of thin layer chromatography and the improvements brought by the high-performance version of the technique. The advantages of HPTLC over traditional TLC were discussed, including its superior resolution, reproducibility, and automation.

2. Principles and Instrumentation

Theoretical insights into the working of HPTLC were provided, covering topics like the stationary phase (silica-coated plates), mobile phase composition, and principles of compound separation. The trainers also explained the components of HPTLC instrumentation, such as the sample applicator, development chamber, densitometer, and software tools used for data analysis.

3. Applications of HPTLC

HPTLC has diverse applications across industries due to its precision, versatility, and costeffectiveness:

- **Pharmaceutical Industry:** Used for analyzing APIs, impurities, and stability studies, as well as quality control of drugs and formulations.
- **Herbal Drug Standardization:** Facilitates fingerprint profiling, consistency checks, and quantification of bioactive compounds in herbal products.
- Food and Beverage Analysis: Detects contaminants, quantifies caffeine, antioxidants, and nutrients in food and beverages.
- **Cosmetics:** Analyzes active ingredients, preservatives, and natural additives in cosmetic products.
- Environmental Studies: Detects pollutants like pesticides and hydrocarbons in soil, water, and air sample

This session provided a solid foundation for understanding the technical aspects of HPTLC and its relevance to the pharmaceutical industry.

Afternoon Session: Practical Demonstration

The afternoon session focused on hands-on training, with a demonstration on quantifying caffeine content in green tea. The steps included:

- I. **Sample Preparation:** Green tea samples were extracted using an appropriate solvent system to isolate caffeine.
- II. **Sample Application:** The prepared samples and caffeine standards were applied to the TLC plates using the Automatic TLC Sampler 4 (ATS 4), ensuring precise and reproducible application.
- III. **Plate Development:** The plates were developed in a controlled development chamber with an optimized mobile phase to achieve effective separation of caffeine.
- IV. **Visualization:** The developed plates were visualized under UV light to observe the separated caffeine spots and their retention factor (Rf) values.
- V. **Quantification:** The plates were scanned using the Camag TLC Scanner 4, and the quantification was performed using VisionCATS software. The peak areas of caffeine spots were compared with those of the standards to determine the caffeine content in the samples accurately.

This practical session demonstrated the efficiency and accuracy of HPTLC in natural product analysis, emphasizing its utility in research and quality control.

4. Data Interpretation and Analysis

The trainers guided participants in interpreting the chromatograms obtained from the caffeine analysis. Calibration curves were discussed, and the importance of standardization in ensuring reliable results was emphasized.

5. Q&A Session

The day concluded with an interactive session, allowing participants to clarify doubts and discuss the broader applications of HPTLC in pharmaceutical and food industries.

Key Learnings

- **Theoretical Insights:** The morning session provided a clear understanding of the principles, instrumentation, and applications of HPTLC.
- Hands-On Experience: The afternoon session reinforced theoretical concepts through practical application, particularly in analyzing caffeine content in green tea.
- **Importance of Standardization:** The role of calibration curves and quality control in ensuring reliable and reproducible results was emphasized.
- **Relevance to Pharmaceuticals:** The training highlighted HPTLC's utility in analyzing active pharmaceutical ingredients (APIs), herbal products, and complex formulations.

Conclusion

The one-day training at Anchrom Enterprises was an insightful experience that bridged theoretical knowledge with practical application. The demonstration of caffeine quantification in green tea highlighted the versatility and precision of HPTLC as an analytical tool.

As an M.Pharm student, the skills and knowledge gained during this session will greatly benefit my academic and professional pursuits.

This visit has been an invaluable step in understanding advanced analytical techniques, and I am grateful for the opportunity to participate in this enriching training session.

Acknowledgments

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