S.S.P. Mandal's

Chandmal Tarachand Bora College, Shirur

Academic Year - 2021-22

Report of **DBT-STAR COLLEGE Scheme** Sponsored

One-day Lecture and hands-on workshop on

'Use of TLC in Research'

Day: Wednesday **Date:** 30/03/2022 **Time:** 10:30 AM to 2:00 PM

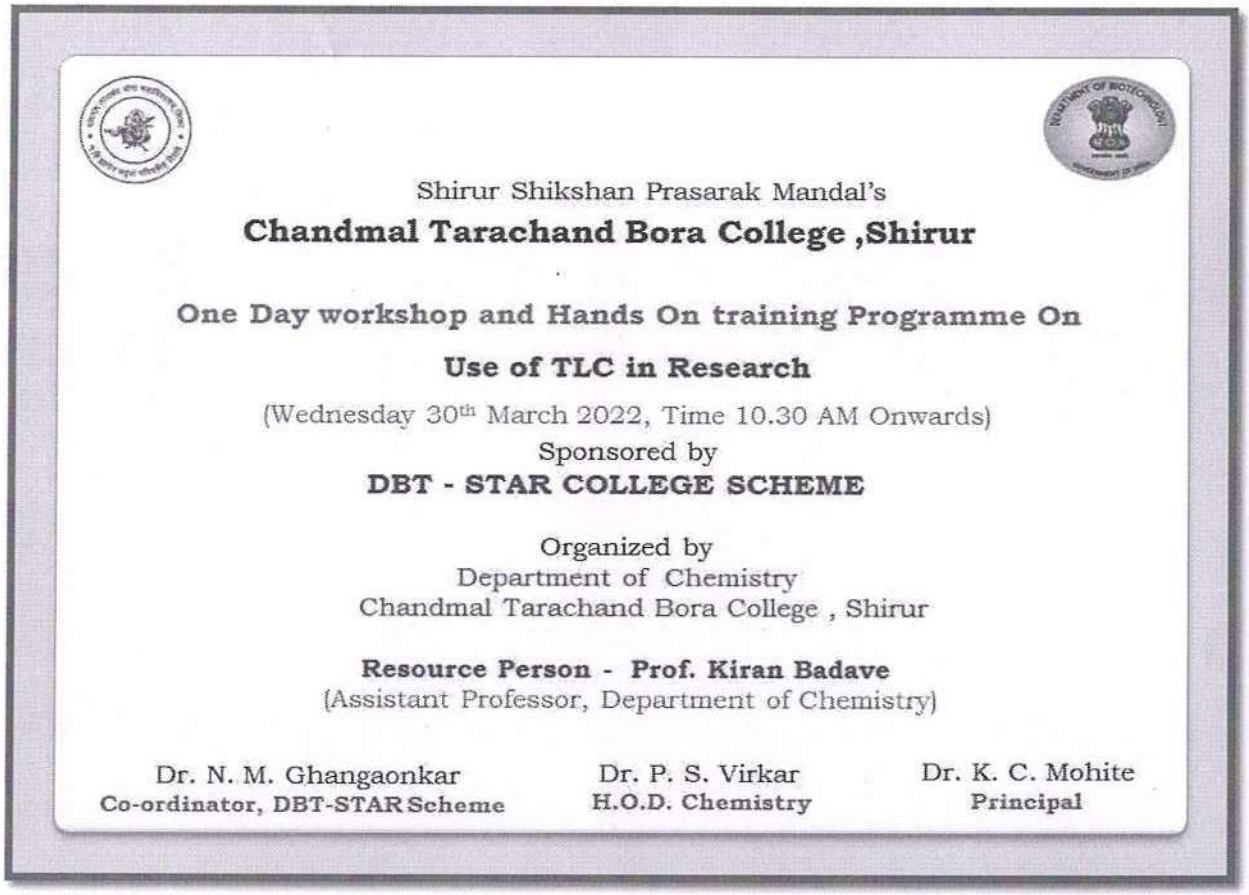
Venue: Seminar Hall (A-18) & Chemistry Laboratory (B-5)

Objective of the program: Students will able to

a) Use of TLC in determining purity of any sample.

b) Use of thin layer chromatography in purification, isolation and identification of natural products.

c) Use TLC in examination of reactions.



Shirur Shikshan Prasarak Mandal's

Chandmal Tarachand Bora College ,Shirur

One Day workshop and Hands On training Programme On

Use of TLC in Research

(Wednesday 30th March 2022, Time 10.30 AM Onwards)

Sponsored by

DBT - STAR COLLEGE SCHEME

Organized by

Department of Chemistry

Chandmal Tarachand Bora College , Shirur

Resource Person - Prof. Kiran Badave

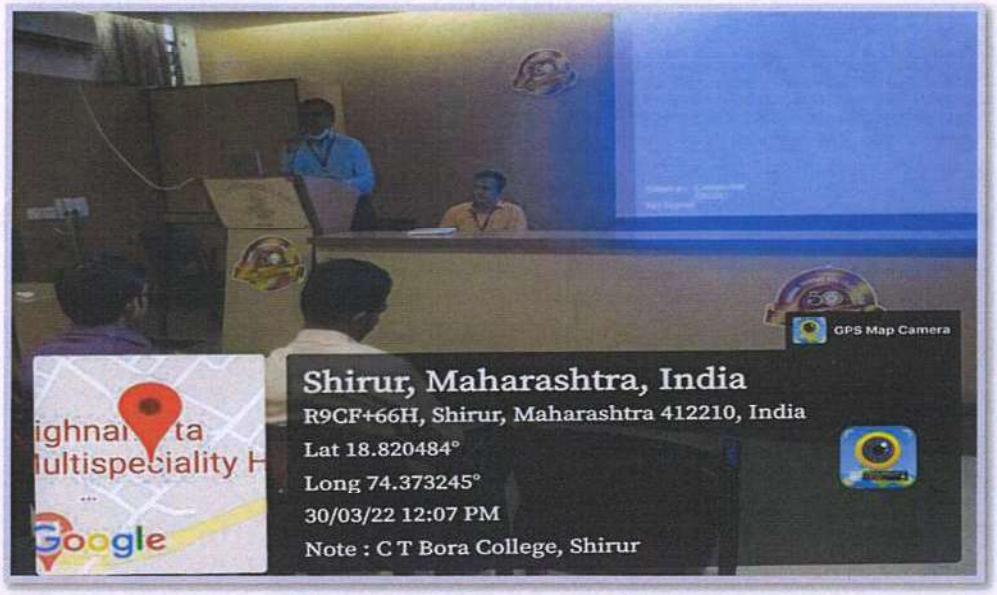
(Assistant Professor, Department of Chemistry)

Dr. N. M. Ghangaonkar
Co-ordinator, DBT-STAR Scheme

Dr. P. S. Virkar
H.O.D. Chemistry

Dr. K. C. Mohite
Principal

Inauguration of Workshop:



Department of Chemistry organized one-day hands-on workshop on 'Use of TLC in Research'. This program was inaugurated by Prof. Kiran Badave, Asst. Professor Department of Chemistry, coordinator of the Workshop. All the participating teachers and students were welcomed. Dr. P. S. Virkar, HOD, Chemistry has given the presidential speech. In his speech, sir aware students and new faculty members about importance of skills in professional world, importance of practical's and importance of curious learning in student's career.

Resource Person Lecture:

Prof. Kiran Badave was resource person for the workshop. He delivered his lecture using power-point presentation. Lecture started with fundamentals of chromatography were discussed. The topics discussed were physical separation of compounds, capillary action TLC development – iodine adsorption phenomena.

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Thin Layer Chromatography (TLC)

- It is a world wide used two dimensional **adsorption chromatography**
- In TLC stationary phase is solid and mobile phase is liquid.
- Thus also known as ***solid-liquid chromatography***

Principle of TLC:

- It is based on the principle of separation of components of a sample on **relative binding affinity** towards stationary phase.
- Due to **capillary action of mobile phase**, the components of a sample gets distributed over the stationary phase. The components which have **high binding affinity to stationary phase travel slowly while the other having low affinity will move faster.**
- **In desorption phenomenon;** separations take place primarily by hydrogen bonding or dipole interaction using lipophilic mobile phases. In short, analytes are **separated into groups based on their polarity.**
- After separation, the individual components are **visualized as a spot** using suitable detectors.

The principle of TLC discussed clarifying the fundamentals of science behind TLC operations and importance of TLC in practical's and research. TLC development were discussed in brief. Basic skills and adequate knowledge required for preparation of TLC plate such as sample preparation, loading of sample, selection of solvents for TLC development, development of TLC plate, identification & location of spots in iodine chamber and TLC

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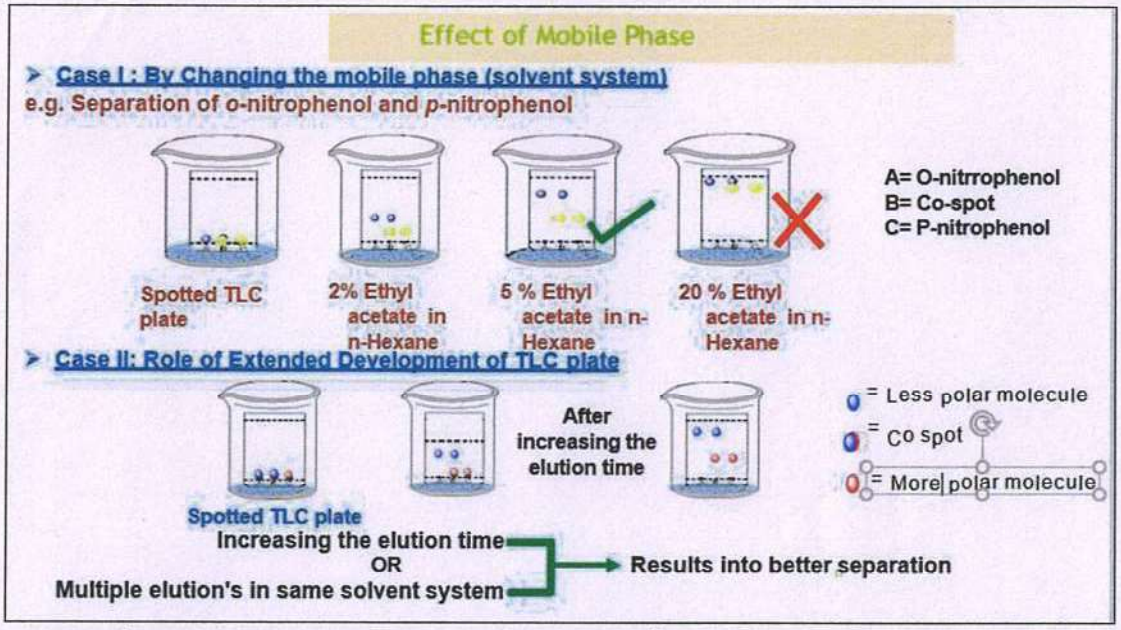
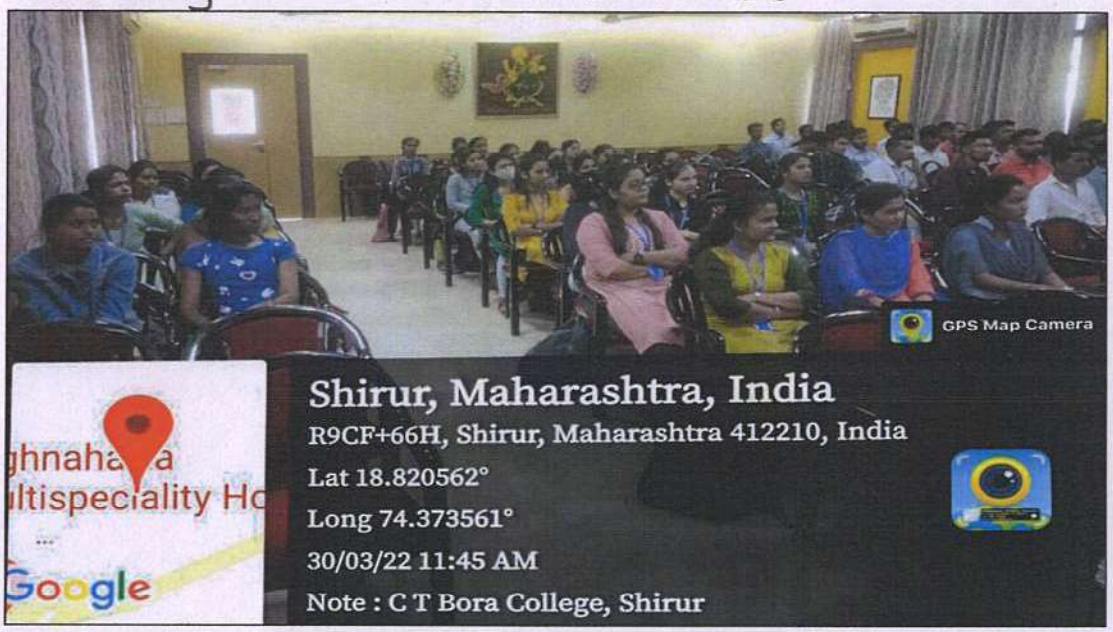
UV-chamber were discussed in brief. This session clarifies the doubts in student's mind. For good research publication or research report submission there is a requirement of obtaining a good TLC. The ideal range of separation of sample with respect to R_f value discussed during thc scssion.

The importance of pre-coated aluminum TLC plates over traditional TLC glass plate and how to reduce edge effect occurred during during the TLC plate development were discussed.



Guiding Session for students.



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Effect of Mobile phase on TLC plate dialogued with the participants which significantly clarifies polar and non-polar compounds and effect of solvent polarity on separation of compounds on TLC plate.

Participants were awared with the important topics of TLC such as use of stationary phases except silica used for TLC development used such as neutral, acid, and basic aluminium oxides (alumina), magnesium oxide, magnesium silicate (Florisil), polyamide 6, glass powder, kieselguhr (diatomaceous earth) etc. The choice of the adsorbent depends upon the nature of the compound.

Use of other detecting agents such as a spray of conc. H_2SO_4 in methanol, 10% phosphomolibdic acid in ethanol, ninhydrin, alkaline $KMnO_4$, 2:4 DNP etc The advanced technique of TLC such as Preparative TLC and High Performance TLC (HPTLC) were also discussed in order to enhance interest of students in the subject. During the session students were encouraged to use reference books, research articles over textbooks.

The program concludes with the vote of thanks. The DBT is acknowledged for providing funds for conduction of program through Star College Scheme. The Principal of the college Dr. K.C. Mohite is acknowledged for his permission and motivation for conduction of Training session. The organisers were very much thankful to DBT-STAR

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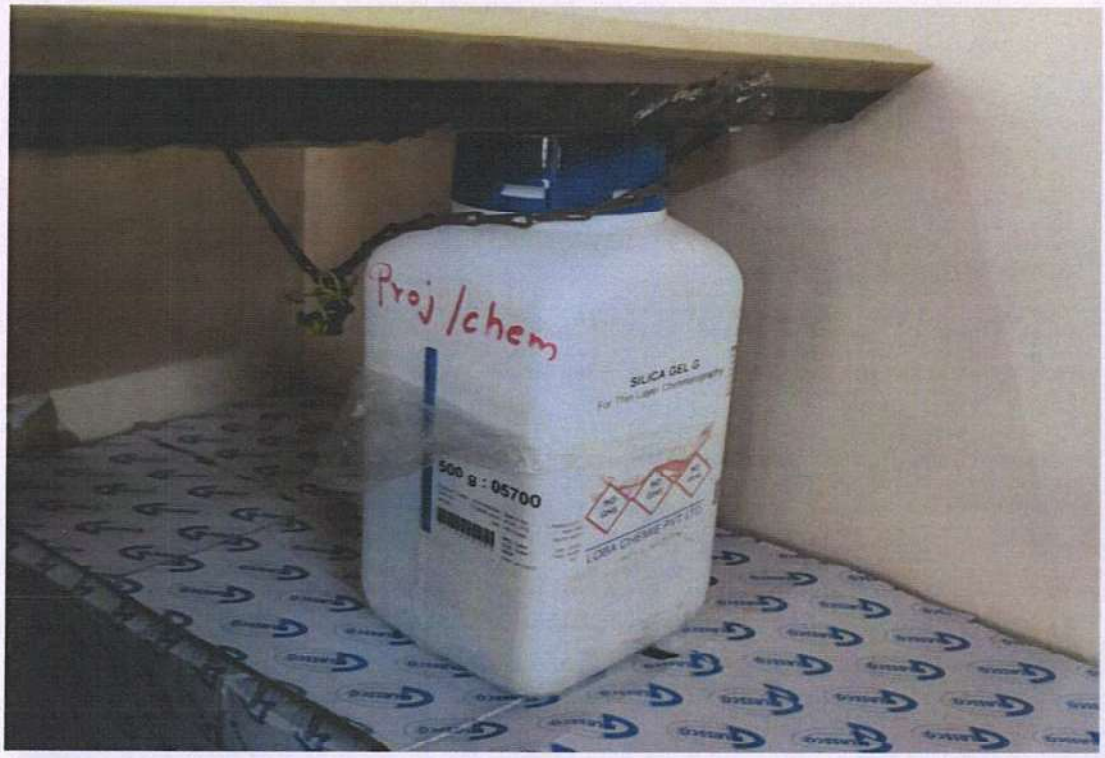
Scheme coordinator, Dr. N. M. Ghangaonkar and HOD Chemistry, Dr. P. S. Virkar for his positive support and freedom during program. The organiser also thanks to the participating teachers and students. 91 students participated in the activity.



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Feedback report of the program was taken through google form. Students given feedbackabout the program as below.

1) TLC is very important preliminary in our practical
2) I'm totally satisfied my all dought clear on this session ecplaintion was very good thanks alot.
3) TLC TECHNIQUE
4) It's too good.
5) How to run TLC Information very important key in event
6) Developing solvent
7) Fundamental concepts of TLC
8) Imp information
9) Clear the all TLC doubt.
10) Valuable part from today's lecture for myself, is that I have Upgraded my Knowledge withyour keywords.
11) Choosing solvent for TLC according to polarity
12) Very informative, basic, easy to understanding
13) Use of TLC in research event is very supported to every student and it is very essential aswell as useful for students. An event is very helpful to create patriotism in every student.
14) Nice
15) Helpful for Research
16) This event, this workshops is most precious and knowledgeable in my future, and i haveunderstand this workshop importance
17) Very helpful
18) TLC is very important preliminary technique in industrial chemistry.

Prof. Kiran Badave
Co-ordinator, Assistant Professor,
Department of Chemistry

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H.O.D. Chemistry
Department of Chemistry,
C. T. Bora College, Shirur
Dist. Pune (Maharashtra)

Dr. N. M. Ghangaonkar
Co-ordinator, DBT-STAR Scheme

Dr. K. C. Mohite
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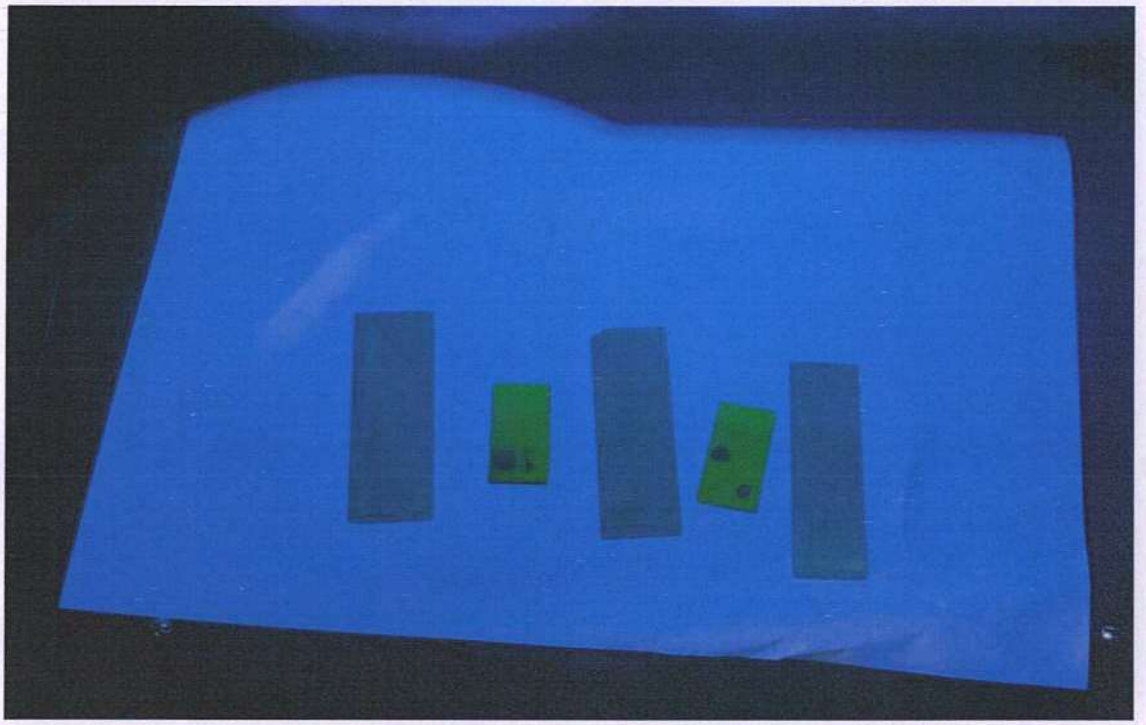

Hands-on training program:

a) Students prepared the TLC plates using precoated aluminium plates
b) Students learnt different methods of TLC development
c) Students used TLC-UV chamber for TLC visualisation

Outcome of the program:-
Students learnt the following points

1) Principle of TLC
2) Merits of Thin Layer Chromatography over other analytical technique
3) Preparation of TLC plate
4) Sample Preparation for loading sample on TLC
5) Selection of Mobile Phase and its effect on TLC
6) Different methods of Development of TLC plate
7) Interpretation of developed TLC
8) Advantages of Use of Precoated TLC plates

Student's awared about

1) Importance of chromatography in research and industry
2) Separation of mixtures into individual components.
3) Purity and authenticity of starting materials and products
4) How to monitor a progress of a chemical reaction

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Shirur Shikshan Prasarak Mandal's

Chandmal Tarachand Bora College, Shirur

(Academic Year 2021-22)

Workshop on Preparation of Use of TLC in Research

Tuesday, 30/03/2022

Organized by **Department of Chemistry**

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