

Virtual Laboratory Experience: Online Module Development



-Dr. Anant R. Kapdi

Laboratory practicals and goals of teaching

Goals for conducting laboratory practicals

- ❖ Deepening understanding of content
- ❖ Building skill in experimental design
- ❖ Data collection
- ❖ Data analysis
- ❖ Presentation of experiments and results

You get ~~two~~ options...



Practical lab experience

or

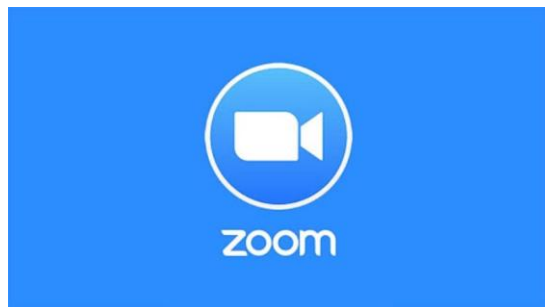


Online lab experience



Development of an Online Laboratory Module

Platforms for online laboratory teaching:



40 mins free
Rs. 1200 per month for unlimited
Recording possible



Free
Recording not possible
Institutional subscription possible



Free
Recording not possible
Institutional subscription possible

Recording of lectures and upload



Open Broadcaster
Software



Modes of teaching:

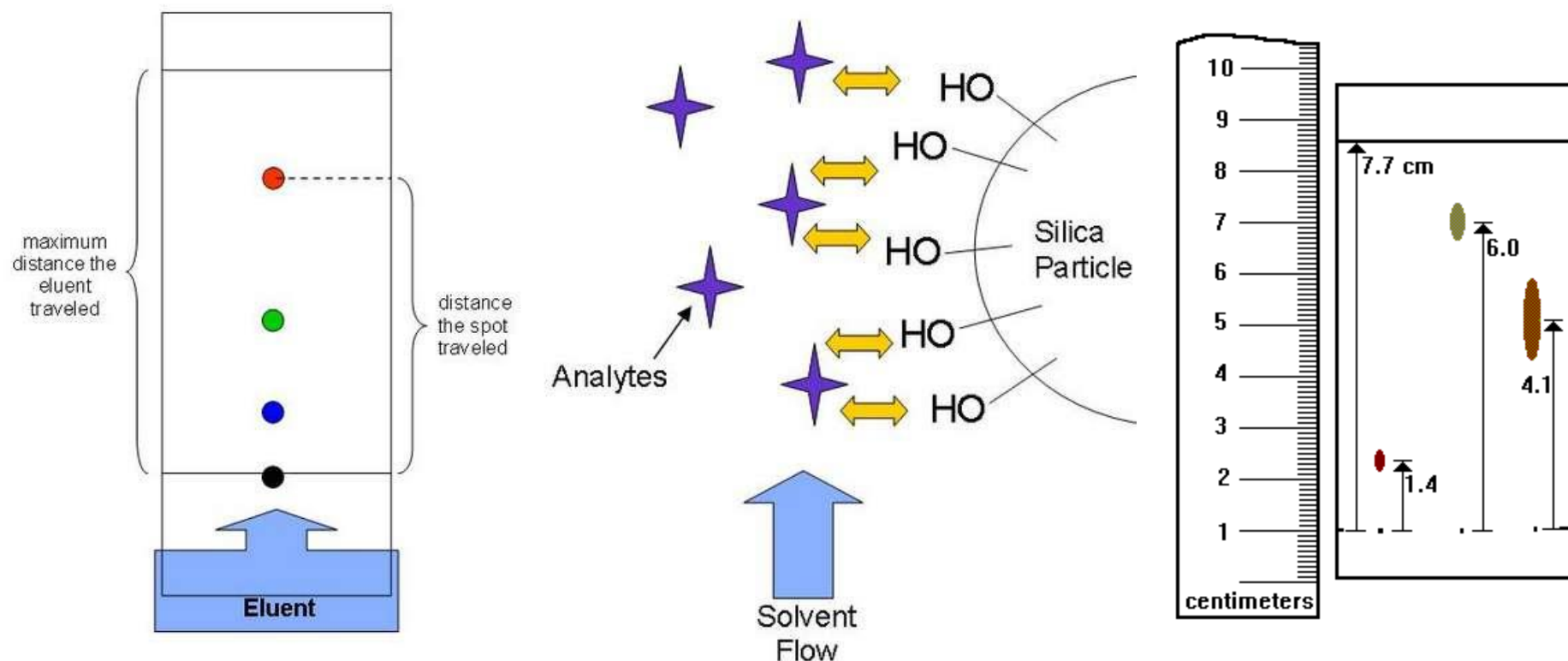
Module 1

- ❖ Creating information source such as PPTs, notes (word or pdf)
- ❖ Using online videos to explain the concepts and enhance the understanding
- ❖ Create Google Classroom for uploading material
- ❖ Using online simulators to provide a virtual experience
- ❖ Provide enough examples to generate data set
- ❖ Generate enthusiasm by conducting live discussions about the experience and problems

Module 1 ❖ Creating information source such as PPTs, notes (word or pdf)

Thin Layer Chromatography (Adsorption chromatography)

Mobile Phase: liquid + Stationary phase: solid adsorbent (silica)



Module 1

- ❖ Using online videos to explain the concepts and enhance the understanding

Online platform:

- ❖ **You tube** has many downloadable videos various topics
- ❖ Use **Youtube Downloader** to download these videos
- ❖ All free softwares
- ❖ Royal Society of Chemistry has also uploaded several videos



TLC chamber preparation.mov



Preparation of sample.mov

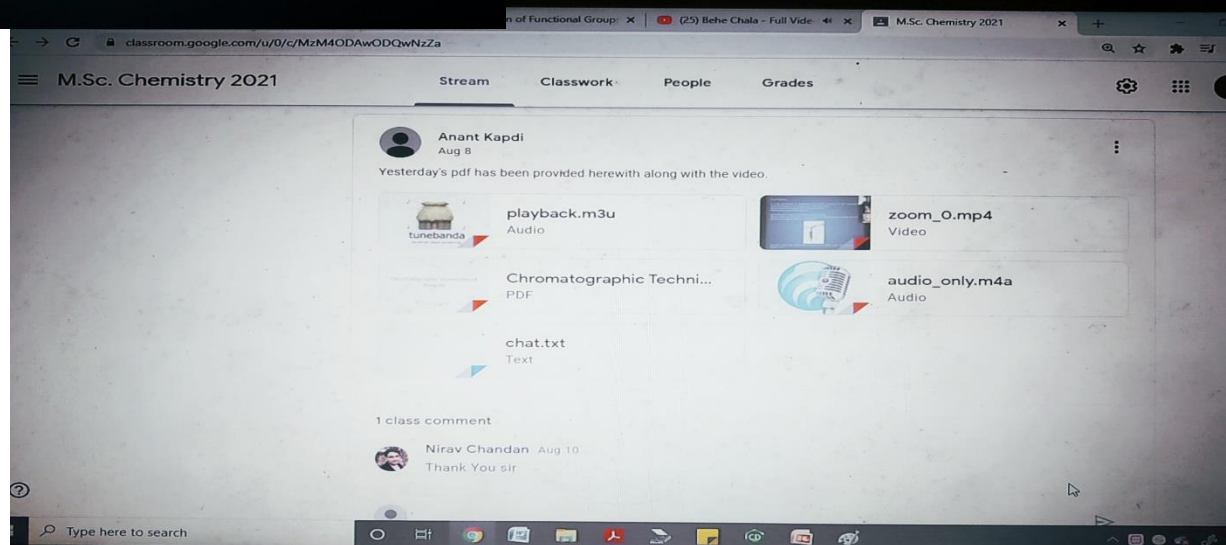
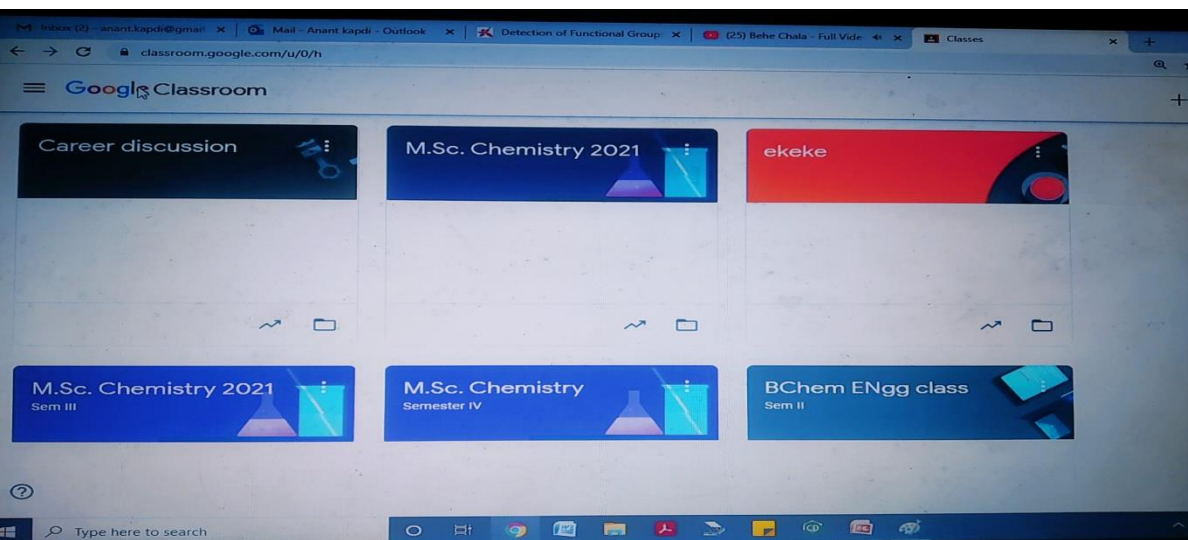


Developing the spots.mov

Development of an Online Laboratory Module

Module 1

❖ Create Google Classroom for uploading material

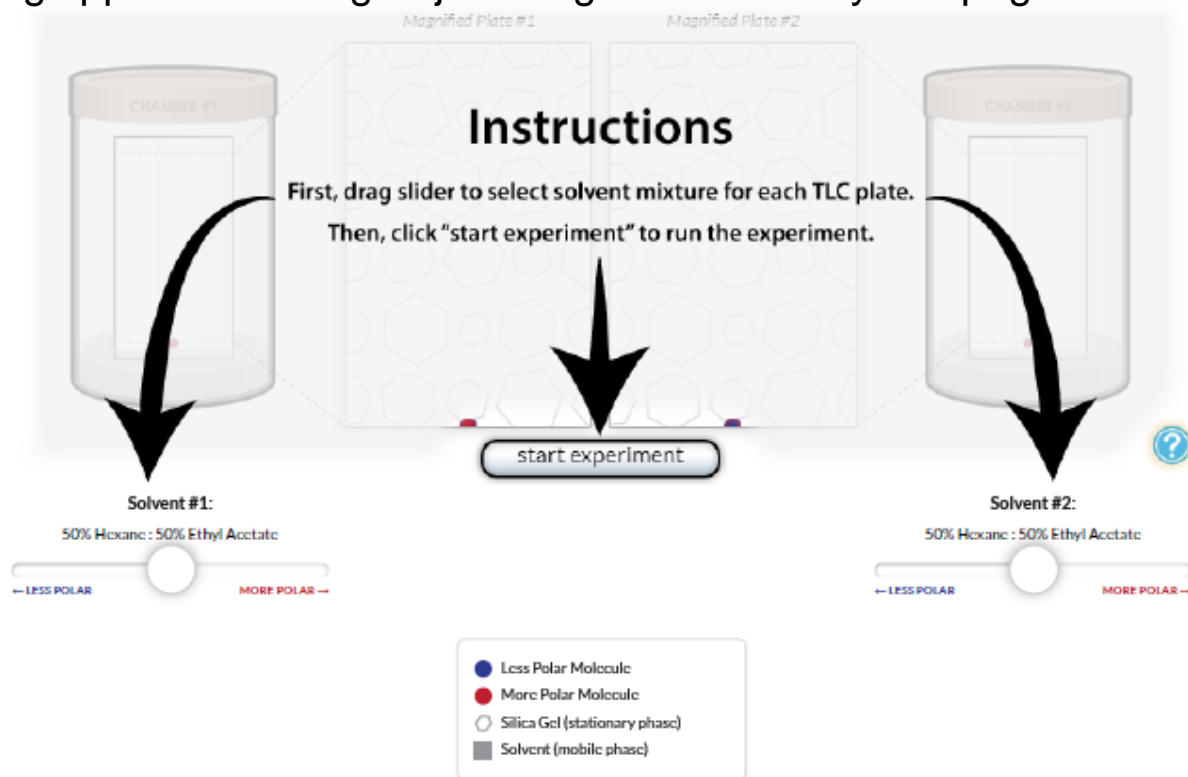


Development of an Online Laboratory Module

Module 1

❖ Using online simulators to provide a virtual experience

<https://elearning.cpp.edu/learning-objects/organic-chemistry/tlc/?page=simulation.html>



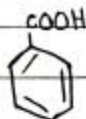
Development of an Online Laboratory Module

Module 1

❖ Provide enough examples to generate data set

TLC:

1)



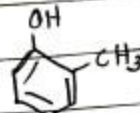
Benzoic Acid

2)



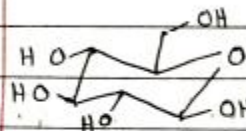
Ethyl Benzene

3)



o-cresol

4)



Glucose

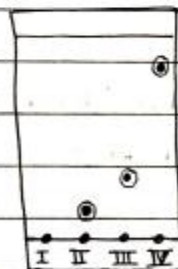
Order of polarity: Glucose > Benzoic acid > o-cresol > ethyl benzene

(I)

(II)

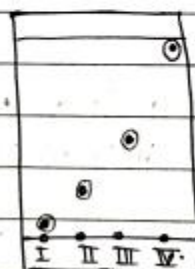
(III)

(IV)



10% EA

90% Hexane



30% EA

70% Hexane



50% EA

20% Hexane

Modules that can be created from the content discussed earlier

- ❖ Gas Chromatography
- ❖ High Performance Liquid Chromatography
- ❖ Ultra-Violet Spectroscopy
- ❖ Infra-red Spectroscopy
- ❖ Nuclear Magnetic Spectroscopy
- ❖ Mass spectral analyzer

Spectral Database for Organic Compounds SDBS


https://sdb.sdb.aist.go.jp/sdb/cgi-bin/cre_index.cgi

Module 2

❖Online Virtual Laboratory Module



An MHRD Govt of India Initiative

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Virtual Amrita Laboratories Universalizing Education



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Nodal Centre List

Current list of Nodal Centres (last updated on Oct 26, 2018)
Total Number of NCs = 111

Sl. No	Institute/Organization	Nodal Coordinator(s)
Maharashtra		
5	Dr. D.Y. Patil Institute of Engineering, Management and Research Sector No. 29, PCNTDA, Nigdi Pradhikaran, Akurdi, Pune 411044	Dr. Sunil G. Dambhare Prof. Firoz Pathan

Thank you

Inspire awardee or CSIR NET or UGC NET JRF interested in joining our research group can have a look at our website and can contact me on the email id given below.

My website: <https://kapdigroupresearch.com/>

Email id: ar.kapdi@ictmumbai.edu.in