

CH105 (D3)

Organic and Inorganic Chemistry

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It was then



TMZ.com



THINGS ARE GETTING BETTER..!!

THEN.....



conference jan2020

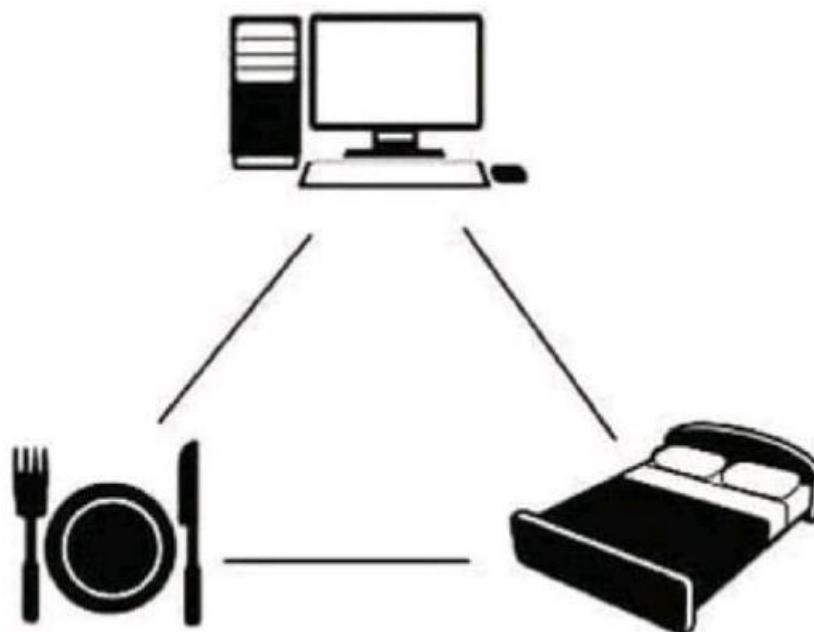
NOW....



webinar july 2020

GRK Sarma 13/7/20

The Ultimate Bermuda Triangle







"I have your MRI results. Half your brain is clogged with passwords and the other half is clogged with user names."

Online teaching-learning

- Online teaching is at best ‘**a compromise**’. It can never be as good as **classroom teaching**
- But then how do we **recreate** the classroom experience virtually?
- **Blackboard/ PPT & live interactions**
- **After class discussions**
- Meeting with **peers** and **learning** from their interactions – **Telegram**

**"Life is like riding a bicycle. To keep
your balance you must keep moving."**

Albert Einstein

Letter to his son Eduard (Feb. 5, 1930)

What we can do as students

- Online teaching is something **we can't avoid** for now
- Use it to **your advantage** – be open to this idea and enjoy your stay with family.
- You just need a **good wifi and a phone or pc.**
- Don't be shy. **Communicate** your difficulties. Remain active. Ask questions during online interactions. TAs
- You tube videos, e-books, and other **resources**
- Take good **care** of your eyes, do physical exercise, running etc and don't put on weight
- Most important – **don't stress**...nothing is more important than your life – everyone is going through same problem in career during pandemic time

Why Organic chemistry?

Organic chemistry is everywhere

- Colorful dresses, textiles
- Cosmetics, make up, Perfumes
- Fuels
- Paints, coatings (bio-conjugation on sensors)
- **organic materials** such as polymers, dyes, pigments, organic semiconductors, OFETs (flexible displays), OLEDs, fullerenes, carbon nanotubes
- **Food – agricultural produce, fungicides, pesticides**
- **Medicines – drugs, vaccines, therapeutics, diagnostics**

Organic chemistry is everywhere

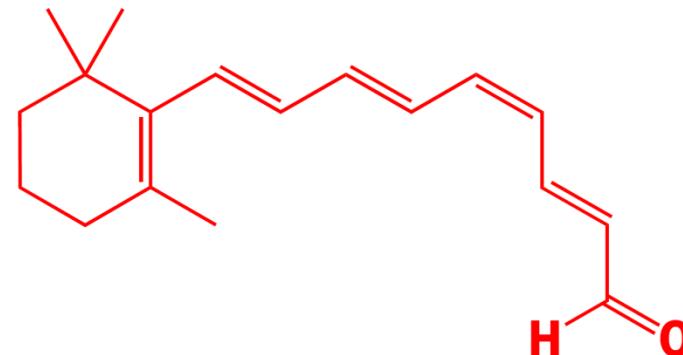
- All life processes are finely tuned biochemical reactions – love, hate, anger, joy, seeing, hearing, smell, taste, touch, immune response and so on,
- Chemical basis of life.
- Building blocks of life - Biomolecules – Proteins, nucleic acids, carbohydrates, lipids are all organic molecules

Chemical Basis of life

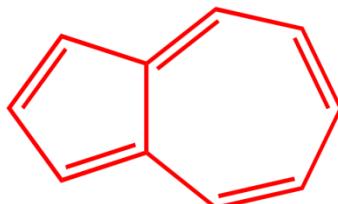
- **New molecules assemble and break down**
- **DNA is copied faithfully (transcription, translation), repair molecules**
- **Protein synthesis with high fidelity**
- **Enzymes – specificity, selectivity and rapid transformations**
- **Infection recognition – immune response, defense mechanism**
- **Wound repair – healing and so on**
- **Signalling pathways**
- **Finely tuned biochemical pathways provide energy ‘ATP’ at the hub.**

Why Organic Chemistry?

Let's look at how our senses respond to molecules!!



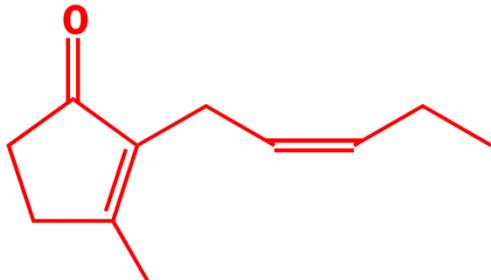
- **Sense of Sight: 11 *cis*-retinal absorbs light when we see**



Azulene, deep blue colour with pepper smell

Why Organic Chemistry?

- **Sense of Smell:** *cis*-jasmone is responsible for jasmine smell.

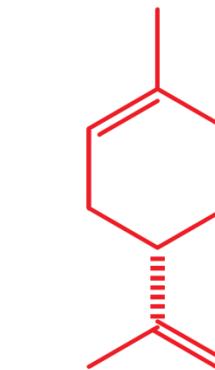


cis-jasmone

enantiomeric
smells



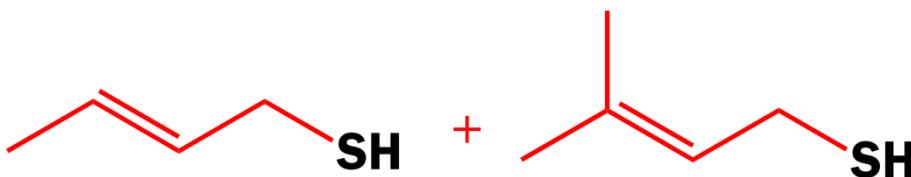
R(+)-limonene
smells of oranges



S(-)-limonene
smells of lemons



skunk spray contains:

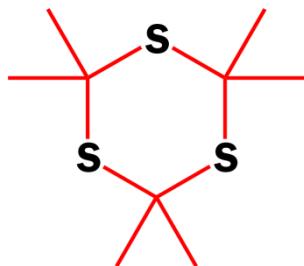


Why Organic Chemistry?



thioacetone

?



trithioacetone;
Freiburg was evacuated
because of a smell from
the distillation this compound

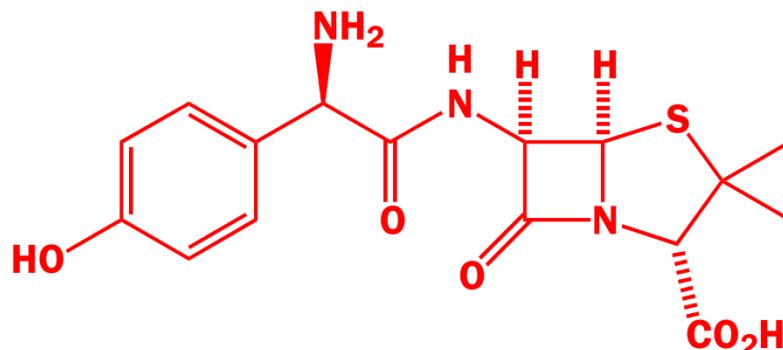
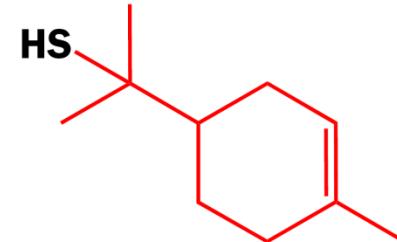
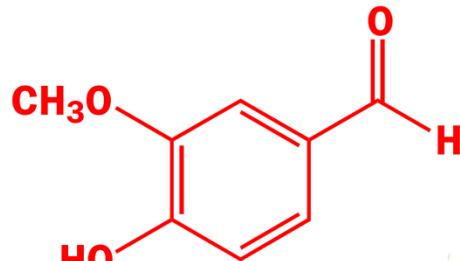


the divine smell
of the black truffle
comes from this compound

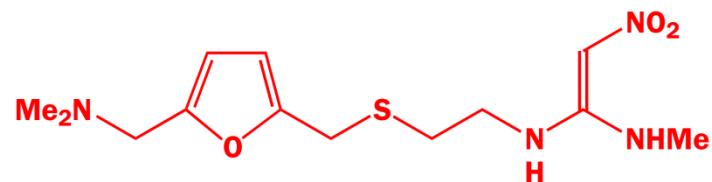


Why Organic Chemistry?

vanillin
found in vanilla pods;
manufactured
on a large scale

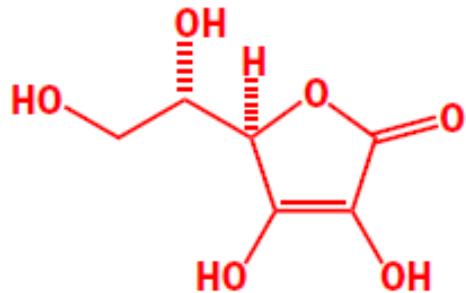


SmithKline Beecham's amoxycillin
β-lactam antibiotic
for treatment of bacterial infections



Glaxo-Wellcome's ranitidine
the most successful drug to date
world wide sales peaked >£1,000,000,000 per annum

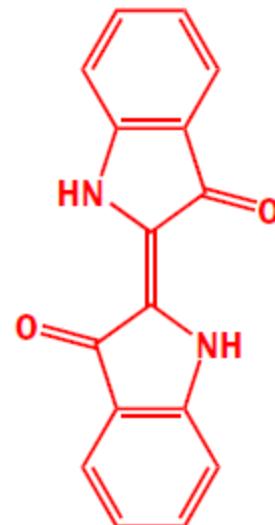
Why Organic Chemistry?



vitamin C (ascorbic acid)

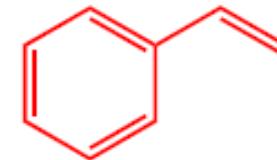


Plastics and clothing fibres come from their polymers.

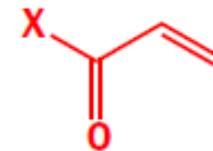


indigo
the colour of blue jeans

monomers for polymer manufacture



styrene



acrylates



vinyl chloride

There is a necessity to understand chemistry and behaviour of molecules

Experiments are indispensable in
organic chemistry
(an empirical science)
but so is logic

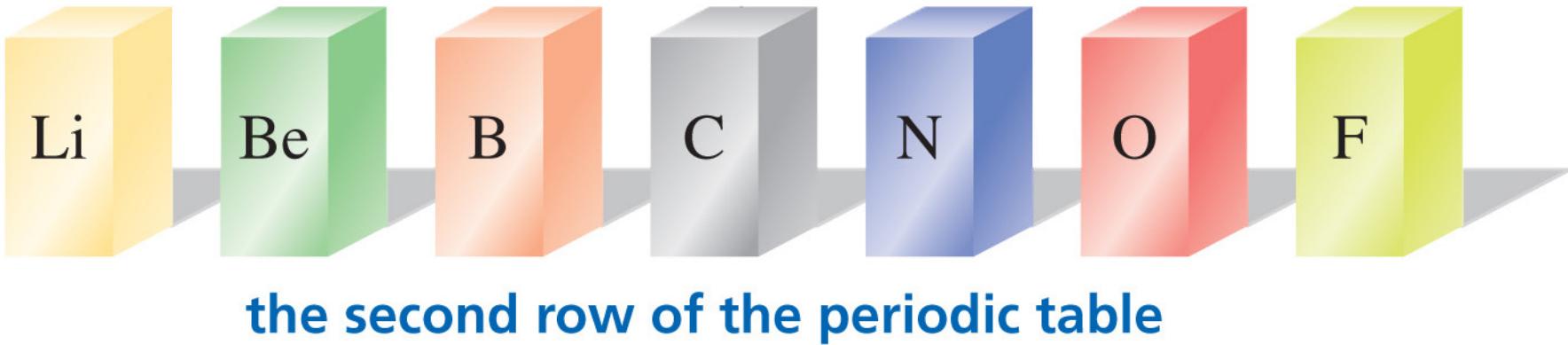
Organic chemistry is not a memory
based discipline.

One needs to understand the basic
concepts and the underlying
principles.

Believe what I say ***only*** when
it makes sense to you.

What if it doesn't?
Can we learn together?

What Makes Carbon So Special?



- Atoms to the left of carbon **give away electrons**.
- Atoms to the right of carbon **accept electrons**.
- **Carbon shares electrons.**

Outline

- **MO theory and Huckel Theory For Conjugated Systems. Aromaticity.**
- **Stereochemistry – symmetry elements but no configuration**
- **Conformational Analysis**

Total number of lectures: 11

- **Mon 11.35-12.30**
- **Tue 8.30-9.25,**
- **Thu 9.30-10-25, D3**

Tutorial Sessions

**When: Wednesdays 2-3 PM,
Dec 1, Dec 8, Dec 15, Dec 22**

**TAs – UG seniors and PhD research
Scholars**

Starting this wednesday

TAs for this course for D3 batch



**Archana
Shirsat**



**Aadil
Pathan**



**Aishwarya
Shelke**



**Prachi
Bhatt**



**Balaji
Solanke**



**Gulazarahin
d Mehta**



**Dnyaneshwar
Gorve**



**Arpit
Agrawal**

All TAs are there on MS teams as well as telegram group.

Text Books

- **Organic Chemistry by Wade/Loudan/Bruice or Solomons**

(Relevant Chapters in PDF from Bruice's Book will be made available to you – through MSTeam file section)

Additional Reading

- **Organic Chemistry, Clayden, Green, Warren and Wothers, Oxford University Press**

Animations

<http://www.chemtube3d.com/>

<http://winter.group.shef.ac.uk/orbitron/>

<http://symmetry.otterbein.edu/gallery/index.html>

Additional Informations

- **Lecture Slides and video recordings**
- **Relevant materials from Books (check the book chapter folder)**
- **Basic and very good book to read : Organic Chemistry by Solomons**
- **Promote cooperative learning: make a group of 5-10 and discuss together at least twice in a week**

Course Outline and Evaluation

- **Organic Chemistry lectures 29rd Nov till 21 Dec.**
- **Inorganic Chemistry from 23 Dec for 3 weeks**
- **Evaluation: Organic + Inorganic (one grade)**
- **For Organic: one exam of 25 Marks (It is final exam for Organic!) – Duration 2 hours**
- **Exam Date: xxx Dec xx, x pm – xpm,**

Broad Overview

CH105

**4-Credit half-
semester course**

Organic

**25 Marks
only one exam**

Inorganic

**25 Marks
only one exam**

Classes from 29 Nov to 21 Dec

**Exam – probable date XX Jan
To be confirmed**

Classes from 23 Dec onwards.

Tutorials: On wednesdays

All on MSTeams

