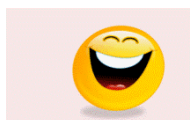


# CHEMISTRY BEHIND THE JOKES

DR



## JOKES BEHIND THE CHEMISTRY...???

- Heisenberg is out for a drive when he's stopped by a traffic cop. The cop says: "Do you know how fast you were going? Heisenberg replies: "No, but I know where I am".
- Two chemists go into a restaurant.  
The first one says "I think I'll have an H<sub>2</sub>O."  
The second one says "I think I'll have an H<sub>2</sub>O too" -- and he died.
- In a glass if we add water and cyclohexane. Which will float? Cyclohexane because it exists in boat form.
- The optimist sees the glass half full.  
The pessimist sees the glass half empty.  
The chemist sees the glass completely full, half in the liquid state and half in the vapor state.
- Some oxygen molecules help fires burn while others help to make water. So, sometimes it's brother against brother.
- A physicist, biologist and a chemist were going to the ocean for the first time.

The physicist saw the ocean and was fascinated by the waves. He said he wanted to do some research on the fluid dynamics of the waves and walked into the ocean. Obviously he was drowned and never returned.

The biologist said he wanted to do research on the flora and fauna inside the ocean and walked inside the ocean. He too, never returned. The chemist waited for a long time and afterwards, wrote the observation, "The physicists and the biologists are soluble in ocean water".

- When one physicist asks another, "What's new?" what's the typical response?  
"C over lambda..."

- A small piece of sodium that lived in a test tube fell in love with a Bunsen burner. "Oh Bunsen, my flame," the sodium pined. "I melt whenever I see you," The Bunsen burner replied, "It's just a phase you're going through."
- Newton, Pascal and Einstein decide to play a game of hide and seek in heaven. Einstein is 'it' and closes his eyes and starts to count. Pascal runs off and hides behind a tree while Newton draws a 1 meter square around his feet. When Einstein finishes counting he spots Newton right away and says "Ah ha! Found you and you lose!" Newton replies, "No. you found 1 Newton over a square meter...you found Pascal"
- Helium walks into a bar,  
the bar tender says "We don't serve noble gasses in here."  
Helium doesn't react.
- Little Willie was a chemist. Little Willie is no more. What he thought was H<sub>2</sub>O was H<sub>2</sub>SO<sub>4</sub>.



Old chemists never die, they just stop reacting.

### Rules of the lab

- If an experiment works, something has gone wrong.
- When you don't know what you're doing, do it neatly.
- Experiments must be reproducible; they should fail the same way each time.
- First draw your curves, and then plot your data.
- Experience is directly proportional to equipment ruined.
- Always keep a record of your data. It indicates that you have been working.
- To do a lab really well, have your report done well in advance.
- If you can't get the answer in the usual manner, start at the answer and derive the question.
- In case of doubt, make it sound convincing.
- Do not believe in miracles--rely on them.
- Team work is essential; it allows you to blame someone else.
- All unmarked beakers contain fast-acting, extremely toxic poisons.
- No experiment is a complete failure. At least it can serve as a negative example.
- Any delicate and expensive piece of glassware will break before any use can be made of it.

Extracted from web

Kokila Ranasinghe (Chemistry special 3<sup>rd</sup> year) ('10/'11)

## **Ban Dihydrogen Monoxide(DHMO).. The Invisible Killer**

Dihydrogen monoxide is colorless, odorless, tasteless, and kills uncounted thousands of people every year. Most of these deaths are caused by accidental inhalation of DHMO, but the dangers of dihydrogen monoxide do not end there. Prolonged exposure to its solid form causes severe tissue damage. Symptoms of DHMO ingestion can include excessive sweating and urination, and possibly a bloated feeling, nausea, vomiting and body electrolyte imbalance. For those who have become dependent, DHMO withdrawal means certain death.

Dihydrogen monoxide:

- Is also known as hydric acid, and is the major component of acid rain.
- Contributes to the "greenhouse effect."
- May cause severe burns.
- Contributes to the erosion of our natural landscape.
- Accelerates corrosion and rusting of many metals.
- May cause electrical failures and decreased effectiveness of automobile brakes.
- Has been found in excised tumors of terminal cancer patients.

CONTAMINATION IS REACHING EPIDEMIC PROPORTIONS!

Quantities of dihydrogen monoxide have been found in almost every stream, lake, and reservoirs. The pollution is global, and the contaminant has even been found in Antarctic ice. Despite the danger, dihydrogen monoxide is often used:

- As an industrial solvent and coolant.
- In nuclear power plants.
- In the production of Styrofoam.
- As a fire retardant.
- In many forms of cruel animal research.
- In the distribution of pesticides. Even after washing, produce remains contaminated by this chemical.
- As an additive in certain "junk-foods" and other food products.

Companies dump waste DHMO into rivers and the ocean, and nothing can be done to stop them because this practice is still legal. The impact on wildlife is extreme, and we cannot afford to ignore it any longer!

IT'S NOT TOO LATE!

Act NOW to prevent further contamination. Find out more about this dangerous chemical. What you don't know can hurt you and others throughout the world.

Extracted from web

Kokila Ranasinghe (Chemistry special 3<sup>rd</sup> year) ('10/'11)

The characteristics we see  
Of chemicals in chemistry  
Are works of God's hand,  
And part of His plan,  
For the earth to function for me.

The way atoms all seem to dance  
In molecules inside of plants  
Is one of the ways,  
God meant to amaze,  
That couldn't have happened by chance.

## **The importance of the path of sustainable development for the future development and stability of the country**

According to the definition of Brundtland Commission sustainable development is “meets the needs of the present without compromising the ability of future generations to meet their own needs” which contains two key elements, the concept of needs and the idea of limitations. It is a pattern of resource use, which aims to meet human needs while preserving the environment. Sustainable development comes under three main categories which are economic development, social development, and environmental protection.

We live in a world of increasing of industrialization, population growth, use of resources and urbanization. Due to the rapid development of technologies the life span of the consumable resources are reduced significantly. In addition global environmental issues such as global warming, acid rains, ozone layer depletion, smog urban air pollution occurred. These were affected to the mankind adversely and created economic problems, social problems, and environmental pollution. As a result of those, sustainable development came in to an account even which was a global need. Summits such as the Earth Summit in Rio, Brazil, 1992, were major international meetings to bring sustainable development to the mainstream. Introducing of ISO Environmental Management System also supported to promote sustainable development throughout the world. Therefore we can get an idea of how much worth or the importance of the path of sustainable development, globally as well as locally.

What criteria should be considered in order for the development of our country? Kofi Annan, former Secretary General of the United Nations, defined a developed country as follows: "A developed country is one that allows all its citizens to enjoy a free and healthy life in a safe environment". The UN has developed the Human Development Index (HDI), a compound indicator which includes statistical indexes such as income per capita (per person) (gross domestic product), life expectancy, the rate of literacy, etc. The UN HDI is a statistical measure that gauges a country's level of human development. While there is a strong correlation between having a high HDI score and a prosperous economy, the UN points out that the HDI accounts for more than income or productivity. Unlike GDP per capita or per capita income, the HDI takes into account how income is turned "into education and health opportunities and therefore into higher levels of human development."

As a third world country we must highly concern the economic development or to increase the GDP. Not only that the social development which includes mainly the education and health, should go parallel with the economic development. If a country possesses a high HDI it is developed and it is stable. Then the people are educated and they are physically strong, so they can contribute to the GDP more by increasing the productivity and the income of the country. That means the country is self sufficient. Therefore the country can provide most of the basic needs to its population by itself. The country does not have to depend on other countries. Even it can challenge other countries too. If a country follows the path of sustainable development it would lead to future development and the stability of the country because the sustainable development contains economic development, social development, and environmental protection.

As the 30 years of conflict ended in our country we have to prepare for a new chapter of development to keep the stability of the country. The path of sustainable development plays a major role there. Achieving future development economically &

socially while protecting the environment directly link with the managing of resources within the country. To manage resources people must be aware of the methods of

preserving resources. For that people need to be educated and must be in a good health condition in order to work hard. They must have positive attitudes regarding the development, they should be innovative, must be able to change the status quo, be able to bear the risk if they fail. The society must contain these types of socially developed people in order to work in the projects undertaken with care to preserve and manage resources, search for technical alternatives to existing energy resources and control land, water and air pollution. If such projects are conducted throughout the country it would help for the economic development as well. It would increase the foreign investment and it would support to reduce the poverty cycle in our country. Therefore it will help to gain the stability of the country.

As the rate of population growth increases with time the consumption of resources increases. Higher consumption will cause for higher wastage. Therefore the wastage should be minimized. Conservation of resources is important concept here. Prevention of loss, waste, damage or destruction of resources, reduction of usage, substitution of materials, recovery and recycling, waste reduction are the ways of conserving resources. Meanwhile the pollution must be prevented. Under the conservation of resources: resource reduction – don't use it, waste reduction – don't waste it, recycling – don't throw it away, treatment – turn it to resources are the major key points.

Our motherland has own natural resources which can be utilized by us in a sustainable manner in order for the future development and the stability. The typical example is water. Hydropower is the best energy source for a country like us because we are rich in fresh water which is a renewable resource. Water needs only to rotate the turbine and electricity is generated thereafter. When the work of water is done it can be purified and distributed for drinking purposes. We can reduce the wastage of water & recycling is done in order to preserve the resource which can be used to another purpose.

Nowadays the main energy source we use is the fossil fuel especially for the auto mobiles. Energy is gained from burning fossil fuels. But it is a nonrenewable energy source which would not last for a long. Replacing fuel vehicles with hybrid vehicles in auto mobile industry is one example of reducing the usage of resources. Reduction of usage of fossil fuels will reduce the emission of CO<sub>2</sub> to the environment. Otherwise it will affect to the green house effect and increase the average atmospheric temperature leading to environmental pollution.

Due to the energy crisis all over the world we should come up with alternatives such as sea waves, wind power, solar power to obtain energy. As we are a tropical country we gain lot of sunlight throughout the year. Therefore solar power can be used in places where we need energy. If we can depend on our resources only as energy sources we don't have to pay for the Middle East countries for oil or fossil fuels. So we can save our money within the country and they can be invested in some other development projects which would provide economic benefits to the country.

Our country is agriculture based one. Vegetables, fruits, paddy, rubber, tea, coconut are grown easily in our lands. Agriculture is one of the resources that we can manage well in order to attain the development and the stability of the country. The path of sustainable development involves for that. If the country is socially developed the people are educated. The knowledge on agriculture can be used to get the maximum harvest from above cultivations. When the productivity increases it would be enough for the

consumption within the country and our country would become a self-sufficient one. And the excess can be exported to gain foreign exchange.

Nowadays most of the people in our country utilize wheat flour-based products which do not provide any beneficial health effects. That is because the provision of rice flour-based products is not enough in the market and we don't possess such technologies to make rice flour-based products in a customer-demanding manner. For those production processes we need money. We need to develop economically in order to invest in those. And we should have knowledge to obtain maximum output from the production process with minimum utilization of resources. Therefore if we follow the path of sustainable development we can easily overcome our problems and can increase the production line of such goods. This will help to increase the job market in our country too. Tea, coconut, rubber cultivation must be increased therefore the export level can be increased. Rubber cultivation contributes to the environmental protection via carbon sequestration. Rubber is the plant which absorbs the maximum amount of CO<sub>2</sub> from the environment.

As our country is an island the sea is another unique resource we have. Sea foods, fish production and the tourism are main two sectors which can be developed in a sustainable way to achieve future development of our country. When we consider the fish stock in the sea if we harvest the fish stock without considering the regeneration time of the fish stock, it will destroy the ability of the reproductivity of the fish. That means fish stock is harvested including ages of very young and ages of reproductive. Therefore, fish stock will be rapidly declined and no more remain. Sometimes it will cause for extinct of a particular species. With these decline of the natural resources it will affect for the economy of the country as it effect for the income of the people as well essential needs of the nutrients of the people. Therefore, harvesting should be done within the sustainable yield. After harvesting is done fish can be canned for export which would support for economic development.

We are well known as the pearl of Indian Ocean. Tourism is one of the main industries in our country. Major tourist attractions are focused around the island's famous beaches located in the southern and eastern parts of the country. Ancient heritage sites located in the interior of the country and lush green resorts located in the mountainous regions of the country. Therefore we can use our natural resources to increase the profits we gain from the foreign countries. Development of tourism industry will cause for economic development. But to obtain the better economic development, natural resources of the country should be used in an environmental friendly manner. Otherwise it would destroy the natural resources satisfying the present needs without remaining for the future. That is why the path of sustainable development is important which preserve the natural resources even for the future generation.

The path of sustainable development includes the development in economic, social sectors and the environmental protection. Socially developed people with higher educational background are knowledgeable in most of the areas, innovative and well disciplined. They know how to manage the resources in the country efficiently and in an environmental friendly manner while preserving the resources for the future generation in order to obtain the maximum productivity by the use of the existing industries and innovations. The famous Sri Lankan statement "the nation with no innovations would never build" proves it. The contribution from those kinds of skilled people to the country will help to improve the economy which would cause for the future development of the country. When the country is economically developed the needs and wants of the people in the country can be easily fulfilled. The country becomes self-sufficient. It leads to the stability of the country. Therefore the path of sustainable development is important for the future development and the stability of the country.

Kasuni Boteju (Chemistry Special 4<sup>th</sup> year) ('10/'11)

## .Turn regular milk into a magical piece of art!

This experiment is adapted from the one by Anne Marie Helmenstine.

### Materials:

- A clean plate
- Milk (2 , whole, whatever)
- Food colouring- as many cool colours as you'd like!
- Some dish detergent
- A cotton swab

### The experiment:

- Pour the milk into the plate. Make sure it covers the entire plate, and that the plate is clean and dry before you use it.
- Place a few drops of food colouring around the milk in different spots. Be creative! This is your chance to create real art.
- Dip the cotton swab in dish detergent.
- Ready? Set? Go! Touch the milk with the dish detergent swab. You can place it at the centre of the plate, or see what happens when you put it in one side! You don't have to stir or move the swab at all, just sit back and watch the magic.

What's going to happen: The food colouring will start to swirl and move in different directions, and the once-white milk will become a magnificent, colourful artwork.



### The chemistry behind the scenes:

Milk is a homogeneous mixture of many chemical substances, elements and compounds. Among these you will find proteins, which are natural compounds found in food and in your body, fats, which are also found in food and in the body and are generally soluble in organic compounds but not in water, calcium (Ca, element #20), and other cool milky stuff.

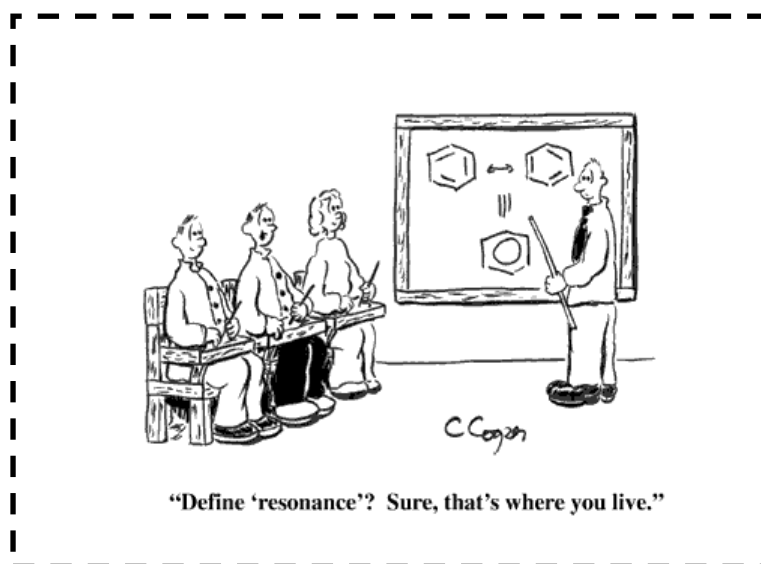


Dish detergents are chemicals designed specifically to clean your plate of food. They contain phosphates, which are compounds that have phosphorus and can dissolve calcium, and various enzymes that break down proteins and fats to smaller particles that can be easily washed away with water. Detergents also contain chemicals called surfactants, which lower the surface tension of a liquid and allow easier spreading.

When we add food colouring to the milk, nothing happens. BUT, when the dish detergent touches the milk, things start to move. The surfactants reduce surface tension, which allows the food colouring to spread around the milk. Then the enzymes start to react with the calcium, proteins and fats in the milk, which causes the colour pigments from the food colouring to get pushed around, resulting in a cool colourful pattern.

So you see, it's not magic. It's chemistry!

T.L.D. Fernando  
Chemistry special 3<sup>rd</sup> year ('10/'11)





BEST WISHES



**FROM**

**LAKMINI MILK BAR**

**No.63,Sri SorathaMawatha,**

**Gangodawila,**

**Nugegoda.**

## ***Senarathne Printers***

***Photocopying***

***Laminating***

***Printing***

***Binding***

**73A, Sri SorathaMawatha,**

**Gangodawila,**

**Nugegoda**



**Four Star Productions**

No: 124/3A, Meethotamulla Road, Wellampitiya, Sri Lanka.

Tel: 011-3068656, Fax: 011-2534721, Hot Line 077-2225175

E-mail: [fourstar.prod@gmail.com](mailto:fourstar.prod@gmail.com)

Our Products & Services:

Hoardings, Bus stands & shelters, Vehicle Branding, Name Boards,  
Light Boxes, Dealer Boards, Gondolas.

## BEST WISHES FROM

☆

☆

☆

Sarasi Communication

- **Photocopy**
- **Laminating**
- **Binding**
- **Printouts**

64/A, Sri Soratha Mawatha,

Gangodawilla,

Nugegoda.

## BEST WISHES

FROM

⌘

⌘

⌘

**Chama Constructions (Pvt) Ltd.**

No. 676/5A, New Kandy Road, Yatihena, Malwana.

100 % Quality 100% Trust 100% Serves

මෙහිදී අපගේ  
මෙම අගනා  
අවස්ථාවක්

රියදුරු පුහුණුව  
ජේන් ලර්නර්ස්

විශ්වාසයෙන් හා වකිනියකින් තොරව රියපැදවීම හා විනයගරුක රියදුරෙක් වන්න අදාළ අප වෙත පියනගන්න.

A ශ්‍රේණියේ රජයේ අනුමැතියලත් ගැහැණු / පිරිමි රියදුරු පුහුණු පාසල මෙම අවසර පරිදි කාර් / වැන් / ට්‍රියෝද රථ / මෝටර් සයිකල් / ඔස් පුහුණුකර බපෙත්‍රය බොදීම.

කාර් වැන් රියදුරු බලපත්‍රය ලබා ගැනීම සඳහා රියදුරු පුහුණුව සහ රජයේ ලියාපදිංචි ගාස්තුව සමඟ අය කරනු ලබන මුළු මුදල රු 11, 800/-ක් පමණි.

අප වෙත පැමිණෙන ඔබට, විශේෂ වාසි රැසක් පිරිනැමේ.

- වාහන පැදවීමට හැකි පුද්ගලයන්ට නොමිලේ පුහුණුවීම වාර 3ක් තිබේ.
  - ඔබ සැමට රියදුරු පුහුණුව ලබා දෙන්නේ අප රියදුරු පාසලේ විදුහල්පතිතුමා විසිනි.
  - ඔබගේ පහසුව සඳහා අප රියදුරු පාසලේ පුහුණුවීම් කාලය උදෑසන 6 සිට රාත්‍රී 10 දක්වා ඔබ වෙනුවෙන් විවෘතව පවතී.
  - ඔබගේ පුහුණුවීම් සඳහා ඔබට සහසු වෙලාවක් වෙන්කරවාගත හැක.
  - ඔබගේ පුහුණුවීම් කාලය තුල රියදුරු පුහුණුව ලබාදෙන්නේ ඔබ සඳහා පමණි.
- ප්‍රායෝගික පරීක්ෂණ පවත්වන දිනයේදී,
- ප්‍රායෝගික පරීක්ෂණයට වාහනය ලබාදීම.
  - ප්‍රායෝගික පරීක්ෂණය දිනයේදී පාසලේ විදුහල්පතිවරයා ඔබ සමඟ සහභාගී වේ.

ප්‍රධාන කාර්යාලය: හො : 24/B/1, ශ්‍රී සෝරත මාවත,  
ගංගොඩවිල  
නුගේගොඩ (විජේරාම, ශ්‍රී ජයවර්ධනපුර, විශ්වවිද්‍යාල පාර)

විමසීම : 0113-131331 / 0712888533 / 0786152037  
 ශාඛා : ගල්විල පාර, මිරිහාන  
 විමසීම : 07759/7053 / 0786152035

*With Best Complements*

FROM

**P.S. Fernando**

**Proprietor**

**ARALIYA AQUA EXPORTS**

**NEGOMBO**

*Our significant contribution to the Sri Lankan  
Health & Research Sector for over 20 yrs . . .*

## P&T TRADING (PVT) LTD



Founded in 1989 P&T Trading (PVT) LTD has been operating for more than 22 years and today it is a Leading HEALTH CARE SERVICE provider specialized in supplying Medical, Laboratory, Bio-Technology, Blood Banking Equipment and Hospital Furniture to our clientele in Sri Lanka and the Maldives.

P&T Trading maintains a Reputation in the industry for being the Sole Agents for Leading Brands such as SANYO Electric Biomedical-Japan, HELMER-USA, LKI-Malaysia, Bio-Rad-USA, BioQuell-UK and Centurion Scientific- UK

We also facilitate funds for Health Sector Development Projects & Turn key solution providers.

Corporate office:  
30/1 Thimbrigasaya Place  
Colombo -05.

Tel : 011 2508888 | 2581054 | 2581028  
Fax: 011 2503153  
e-mail: ptbm@slmet.lk | ptsd@slme.lk

SANYO Bio Medical



Japan

Vivantis  
Malaysia



Astek BioQuell

UK



NYX Technik  
USA



Centurion  
UK



Bio-Rad  
USA

BioRad  
USA



SANYO



BIO-RAD

vivantis



# Pathum Creation & Construction (pvt) ltd.

**BUILDING CONTRACTOR**

**LABOUR SUPPLIER AND BUILDING MATERIAL SUPPLIER**

**HIRE OF CONSTRUCTION**

**MACHINERY**

**NO 699, NEW KANDY ROAD, YATIHENA, MALWANA.**

**FAX : 0114-859105, MOBILE : 0717-399849, 0718399849**

# BEST WISHES

FROM

*RASHMI AMANI FERNANDO*

*(Special batch 11)*



## Why Mosquitoes Attract Some Persons More??



### Why Mosquitoes attract us???

Humans release 1-Octen-3-ol (octenol) with their sweat which is a common attractant released by vertebrates which in combination with carbon dioxide ( $\text{CO}_2$ ) attracts hematophagous arthropods including mosquitoes. A receptor neuron contained within the Sensory Organ (basiconic sensilla on the maxillary palps) of adult mosquitoes responds selectively to 1-octen-3-ol. This sensory organ was selectively sensitive to (R)-(-)-1-octen-3-ol, one of two enantiomeric forms.

Lesser responses were elicited by stimulation with the (S)-enantiomer and various structural analogs. The octenol neuron is exquisitely sensitive to (R)-(-)-1-octen-3-ol; comparable responses to (S)-(+)-1-octen-3-ol were elicited only at stimulus doses over 100 $\times$  that required for the (R)-enantiomer. An intermediate response closer to that elicited by the (R)-(-)-enantiomer was elicited by racemic 1-octen-3-ol. *So if some person produce more R)-(-)-enantiomer more than the (S)-(+)-1-octen-3-ol in his/her body he/she will attract by Mosquitoes more.*

Small structural changes in (R)-(-)-1-octen-3-ol resulted in large decreases in responses. Chain length, unsaturation, location of chiral center, and functional group are important for activity. Moving the chiral center to C4 (1-octen-4-ol) reduced the effectiveness of the stimulus. Shortening (1-hepten-3-ol) or lengthening (1-nonen-3-ol) the carbon chain also greatly reduced the effectiveness of the stimulus as compared with the (R)-(-)-1-octen-3-

ol. The achiral 1-octen-3-ol is less effective in stimulating the octenol neuron as compared with the (*R*)-enantiomer of octenol.

*What problems can be caused by mosquito bites???*

Ordinarily, the bites of mosquitoes and other insects are just a nuisance, although the bite may cause itching or swelling. The symptoms of an insect bite can usually be treated with over-the-counter medications. However, in rare situations, an insect bite can transmit certain diseases such as West Nile virus, St. Louis encephalitis and California (LaCrosse) encephalitis.

*What are the active ingredients in Mosquito coils??*

- DEET (N,N-diethyl-m-toluamide)–Mostly used main ingredient in coils
- Pyrethrins (Extract of insecticidal chemicals in pyrethrum)
- Allethrin (sometimes d-trans-allethrin) (The first synthetic pyrethroid)
- Esbiothrin (A form of allethrin)

*How do DEET in Mosquito Coils and other repellents work???*

Mosquitoes and other blood-feeding insects find their hosts by body heat, skin odors, carbon dioxide (breath), or visual stimuli. Females need a blood meal to develop their eggs. DEET is believed to work by jamming the insect olfactory receptors. There is a volatile substance, the 1-octen-3-ol, a volatile contained in human sweat and breath, which attract the insects. How Deet repellent acts is that it effectively "blinds" the insect's senses so that it is not prompted by humans or other animals which generate these chemicals. However, the action of Deet repellent does not appear to include any affect on the insect's ability to smell carbon dioxide.

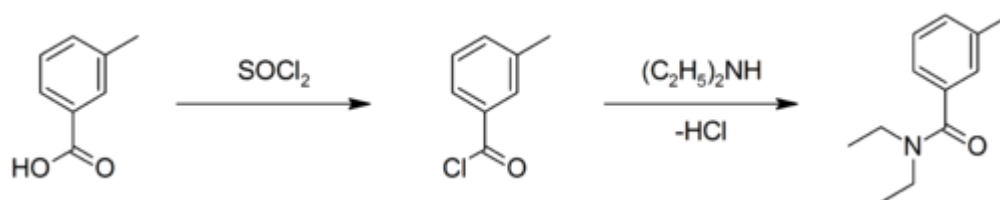
When any insect gets close to a host, DEET repellents block the insect's sensors, thus confusing the insect. There is a type of olfactory receptor neuron in special antennal sensilla of insect that gets activated by DEET. Therefore, it is unable to locate and bite the host successfully. As the Deet repellents are effectual only at small distances from the treated surface, so the user may still see insects and mosquitoes hovering nearby. So, as long as a person is not getting bitten, there is no reason to apply more DEET.

Moreover, in a behavioral testing of the mode of action of Deet repellent, it has been found to have a strong repellent activity in the absence of body odor attractants such as 1-octen-3-ol, lactic acid, or carbon dioxide. When a DEET repellent is applied to the skin, it evaporates and the vapors of the chemical slow down the binding of the lactic

acid to the insects chemical receptors. This basically "hides" the treated person from the insects.

How DEET can prepare??

It can be prepared by converting *m*-toluic acid (3-methylbenzoic acid) to the corresponding acyl chloride, and allowing it to react with diethylamine.



Effect on HEALTH???

As a precaution, manufacturers advise that DEET products should not be used under clothing or on damaged skin, and that preparations be washed off after they are no longer needed or between applications. DEET can act as an irritant; in rare cases, it may cause skin reactions.

children under 2 should not receive more than 1 application of repellent in a day and DEET based products of any concentration not be used on infants under 6 months.

Recently, DEET has been found to inhibit the activity of a central nervous system enzyme, acetylcholinesterase, in both insects and mammals. This enzyme is involved in the hydrolysis of the neurotransmitter acetylcholine, thus playing a role in the function of the neurons which control muscles. Because of this property, many insecticides are used to block acetylcholinesterase, which leads to an excessive accumulation of acetylcholine at the synaptic cleft, causing neuromuscular paralysis and death by asphyxiation. DEET is commonly used in combination with insecticides and has the capacity to strengthen the toxicity of carbamates, a class of insecticides known to block acetylcholinesterase. These findings bring evidence that, besides having known toxic effects on the olfactory system, DEET also acts on the brain of insects, and that its toxicity is strengthened in combination with other insecticides.

Chandima Jeewantha Narangoda  
3<sup>rd</sup> Year Chemistry special ('11/'12)

## Lipstick

Lipstick is a cosmetic product containing pigments, oils, waxes, and emollients that applies color and texture to the lips. There are many varieties of lipstick. As with most other types of makeup, lipstick is typically, but not exclusively, worn by women.



### The history behind lipstick

Ancient Mesopotamian women were possibly the first women to invent and wear lipstick. They crushed semi precious jewels and used them to decorate their lips. Women in the ancient Indus Valley Civilization applied lipstick to their lips for face decoration. Ancient Egyptians extracted purplish-red dye from fucus-algin, 0.01% iodine, and some brominemannite, which resulted in serious illness. Cleopatra had her lipstick made from crushed carminebeetles, which gave a deep red pigment, and ants for a base. Lipsticks with shimmering effects were initially made using a pearlescent substance found in fish scales.



Later in the 16th century, Queen Elizabeth I always wore red lipstick and white make up, but not everyone liked this. And in 1770, the British Parliament passed a law that stated that a woman wearing lipstick could be tried for witchcraft. In 1800, Queen Victoria of Britain said it was considered "impolite" to wear any make up. Later, during World War II lipstick was made very popular by Hollywood starlets like Gloria Swanson and Lana Turner, who wore bright red lipstick in all their movies.

### Ingredients

Lipstick is made up of different waxes, oils, pigments, and emollients. The wax is used for the shape and ease of application. One wax used is beeswax, which is made of esters of straight-chain monohydric alcohols with even-numbered carbon chains from

C<sub>24</sub> to C<sub>36</sub> and straight-chain acids also having even numbers of carbon atoms up to C<sub>36</sub>. There is also carnauba wax, an exudate from the pores of Brazilian wax palm tree leaves, and candelilla wax, coming from the candelilla plant produced in Mexico.

The oils and fats are olive oil, mineral oil, castor oil, cocoa butter, lanolin, and petroleum. More than fifty percent of lipsticks made in the United States contain large amounts of castor oil. It makes a strong, shiny film when it dries up after use. But, when large amounts of castor oil are consumed, it causes the need to urinate. However, other moisturizers like vitamin E, aloe vera, collagen, amino acids, and sun

screen are put in lipstick. This keeps the lips soft, moisturized, and protected. Lipstick is made from grinding and heating ingredients. Then heated waxes are added

to the mix for texture. Oils and lanolin are added for specific formula requirements. Afterwards, the hot liquid is poured onto a metal mold. The mixture is chilled and kept cool so that the lipsticks harden. Once they have hardened, they are heated in flame for half a second to create a shiny finish and to remove imperfections.

Lipstick gets its color from a variety of added pigments. Among them are bromo acid, D&C Red No. 21, and related dyes. Other common lipstick dyes are D&C Red No. 27 and insoluble dyes known as lakes, such as D&C Red No. 34, Calcium lake, and D&C Orange No. 17. Pink shades are made by mixing titanium dioxide with various shades of red. There are five different types of lipstick, namely Matte, Crème, Pearl/Frosty, Gloss and Long lasting & Transfer-resistant lipsticks.

- Matte lipsticks are heavy in wax and pigment but lighter in emollients. They have more texture than shine.
- Crèmes are a balance of shine and texture. Glosses have a high shine and low color. Sheers and stains contain a lot of oil and a medium amount of wax with a tad of color.
- Frosted lipsticks include a pearling agent--often a bismuth compound--that adds luster to the color. Bismuth oxychloride, which is synthetic pearl, imparts a frost or shine. Bismuth subcarbonate is used as a skin protective. Most bismuth compounds used in cosmetics have low toxicity when ingested, but they may cause allergic reactions when applied to skin.
- Long-lasting color lipsticks contain silicone oil, which seals the color to your lips.
- Lip gloss usually comes in jars and contains different proportions of the same ingredients as lipstick but usually has less wax and more oil to make the lips shinier.

**How does lipstick stick to your lips?**

Most lipsticks are made of a solid, insoluble waxy material mixed with a non-volatile oil, so that it can be moved around with ease and applied again and again without it becoming stiff.

The real reason why lipsticks make your lips look so intense is not because of the pigment. It's because the pigment reacts vigorously with the NH<sub>2</sub> group proteins that are found on the surface of our skin, which makes the lipstick turn dark red. Many substances ensure that the texture and melting point of the lipstick remains the same.

For example, esters of fatty acids (oils obtained from plants and animals) are added to give lipstick its 'stickiness'. A chemical called titanium oxide is added to give brightness.

Cetyl alcohol is the ingredient which prevents lipstick from melting. Some lipsticks contain aloe vera to provide protection for your lips.

S.A Athukorale & Varuni Gurusinghe  
3<sup>rd</sup> year Chemistry special part 1 ('10/'11)

## Love

Love is a polymer,  
Made up of a mixture of monomers, as  
Happiness, tear and passion.  
Flows from one heart to another  
Spontaneously, but irreversibly.  
Mechanical synthesizing  
May be harmful;  
Natural synthesizing  
May be effective.  
Overdose cause romance.  
Addiction may cause lifelong happiness.

Testing with many hearts,

Can be poisonous!

Sankhi Hiranya Karawita

1<sup>st</sup> year ('10/'11)

CHE/PBT/MAN

## Global Issues...

### Climate Change Alters Ocean Chemistry

Researchers have discovered that the ocean's chemical makeup is less stable and more greatly affected by climate change than previously believed. Researchers report that during a time of climate change 13 million years ago the chemical makeup of the oceans changed dramatically. The researchers warn that the chemical composition of the ocean today could be similarly affected by climate changes now underway – with potentially far-reaching consequences for marine ecosystems.



*During a time of climate change 13 million years ago the chemical makeup of the oceans changed dramatically. (Credit: Copyright Michele Hogan)*

"As CO<sub>2</sub> increases and weather patterns shift, the chemical composition of our rivers will change, and this will affect the oceans," says co-author Ken Caldeira of the Carnegie Institution's Department of Global Ecology. "This will change the amount of calcium and other elements in ocean salts."

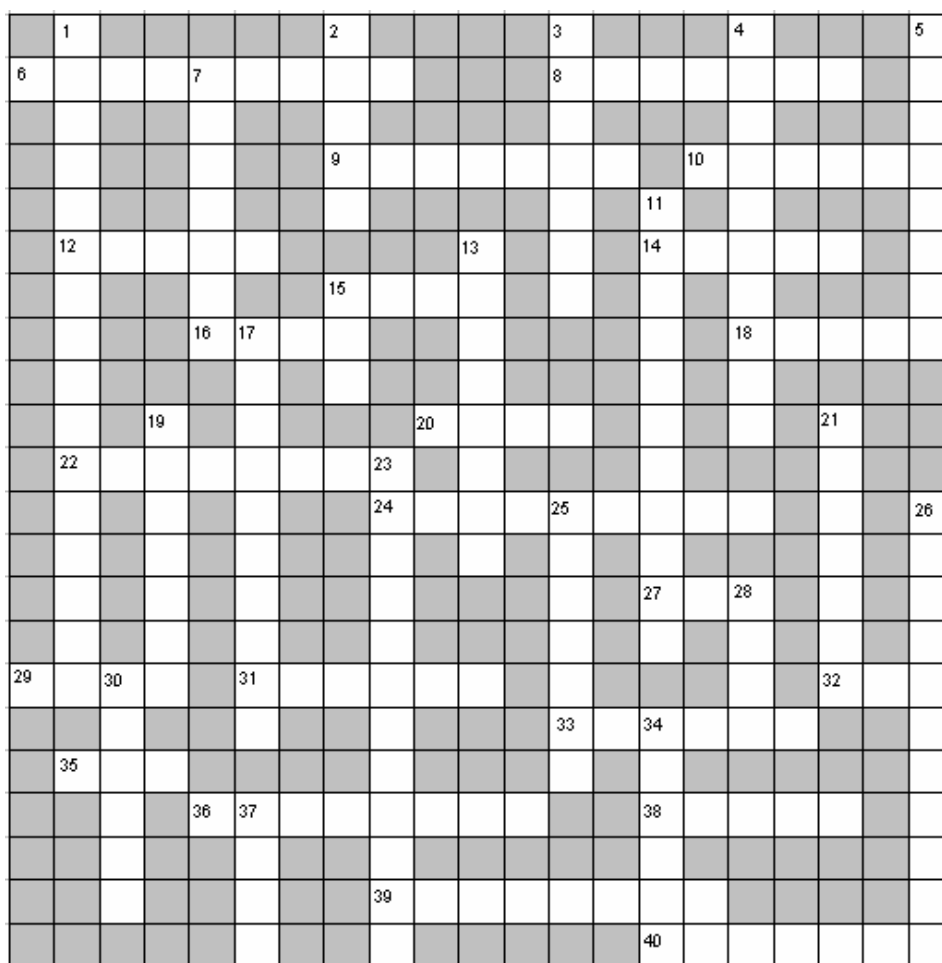
Like a piece of chalk dissolving in vinegar, marine life with hard shells is in danger of being dissolved by increasing acidity in the oceans. Ocean acidity is rising as sea water absorbs more carbon dioxide released into the atmosphere from power plants and automobiles. The higher acidity threatens marine life, including corals and shellfish, which may become extinct later this century from the chemical effects of carbon dioxide, even if the planet warms less than expected.

The ocean plays a major role in the uptake of carbon dioxide emitted from fossil-fuel burning, helping to moderate future climate change. However, the addition of the gas to the ocean alters marine chemistry by increasing acidity (decreasing pH), posing a threat to shelled organisms and the predators that feed off them.

www.sciencedaily.com

R.H.A.C.U. Ranasinghe  
(Chemistry Special 4<sup>th</sup> year) ('10/'11)

### CHEMI-PUZZLE



#### Down

- 1 backbonding from adjacent sigma bond
- 2 one mode of attachment for bicyclic system
- 3 wish I got more of this in lab (not pizza)
- 4 saturated substructure (two words)
- 5 best odds; optically inactive
- 7 cationic alcohol
- 11 Osama bin Laden; from UV + Cl<sub>2</sub> (two words)
- 13 a jar of cherries smells nice because of this
- 15 Michigan global chemical company
- 17 the *rectus* glove is a *sinister* fit
- 19 Gemini twins move to adjacent neighborhoods
- 21 cyclic ester
- 23 isomers not related by blood nor mirror image
- 25 reactive! divalent electrophilic carbon species
- 26 loving to look for positive circumstance

#### Across

- 6 protonated dihydrogen oxide
- 8 do this on New Year's to enhance your purity
- 9 oxocyclopropane
- 10 benzenoid that rhymes with Eileen (momma's name)
- 12 comfortable conformation for sitting around
- 14 isomers like 1-bromo and 2-bromo propane
- 15 two alcoholic to drive
- 16 symmetrically constituted
- 18 after lightening smell
- 20 when sulfur replaces oxygen
- 22 only in ether will it form
- 24 chlorine has this effect
- 27 when nitrogen replaces carbon
- 29 alcoholic olefin
- 31 you can make a Grignard in these
- 32 unsaturated suffix
- 33 Seinfeld nemesis; perspectives can be staggering
- 35 radio wave probe technique
- 36 when carbon genuflects
- 38 just another guy with an acid theory



28 biblical moniker for dad  
30 dense oxygenator element  
34 this pond was never inverted  
37 do not drop it you hippie! it is corrosive

## FINAL YEAR STUDENTS RESEARCH PROJECTS ('10/'11)

	Name of the Student	Research Topic	Supervisor(s)
01.	G.M.C. Alwis	Preliminary investigation for carbon dioxide emission control by sea water algae and hydrilla verticillata	Dr. C.D. Jayaweera
02.	W.D. Chamini	Improvement and comparison of the cure characteristics and physical properties of vulcanizates of skim rubber and yellow fraction separately in the formulation	Prof. L.M.K. Tilakaratne
03.	G.U. Chandrasiri	Analysis of total arsenic residues in chicken eggs	Dr. B.A. Perera
04.	J.F.S. Fernando	ZnO nanoparticles as an activator for natural rubber latex	Dr. Nilwala Kottegoda
05.	W.R.S. Fernando	Heavy metal analysis in alligator weed and compare with mukunuwenna	Dr. C.P. Mahathanthila
06.	F.R. Hassan	Influence of hydrogen peroxide and chlorine gas on leaching kinetics of ilmenite	Prof. P.M. Jayaweera
07.	P.M.S. Ishani	Studies on synthesis, characterization and ion exchange of Nelli (Phyllanthus emblica) tannin based phenol-formaldehyde resins	Dr. L. Karunanayake
08.	K.A.K.M. Kuruppu	Effect of maturation time of the coagulum on the crepe rubber properties	Prof. L.M.K. Tilakaratne
09.	K.G.S. Madushi	Isolation, characterization and quantification of proanthocyanidin in inflorescence of Cocos nucifera L.	Prof. A.M. Abesekara, Dr. C. Padumadasa
10.	M.M.R.S. Marasinghe	In situ transesterification of coconut refuse to produce fatty acid esters (biodiesel) by using dry yeast	Prof. P.M. Jayaweera
11.	N.B.W.P. Sandaruwan	A study of the interactions of milk with different grades of black tea and determination of their antioxidative properties	Prof. Siromi Samarasinghe
12.	V.L. Ukwattage	Comparison of BHT migration from plastic bottles to food product and the effect of the storage time on the migration	Dr. B.A. Perera
13.	F.N. Zavahir	Systematization of touchstone method for gold analysis and comparison with other available analytical methods	Prof. W.D.W. Jayathilake
14.	W.K.C. Boteju	Improving rubber to nylon bonding of the tire carcass with the use of dry bonding agents	Prof. Sudantha Liyanage
15.	B.T.G. Fernando	Cyclisation of 4,7-dioxocarboxylic acid into a cyclopentenone system	Prof. A.M. Abesekara, Dr. C. Padumadasa
16.	P.D.S. Kulathilake	Development of Neoprene rubber compatibilized carbon black filled NR/NBR composites	Prof. L.M.K. Tilakaratne

17.	J.A.V. Mahesha	Sequential fractionation of micronutrient metal ions in organic compost fertilizer	Dr. S.D.M. Chinthaka
18.	R.H.A.C.U. Ranasinghe	Kinetic studies of ilmenite dissolution in sulphuric and hydrochloric acid solutions	Prof. P.M. Jayaweera
19.	P.L.P. Tissera	Use of single drop micro solvent extraction technique for the determination of trace level of organic pollutant in water bodies	Dr. S.D.M. Chinthaka

## *Our Special Thanks!*

*Prof. Sudantha Liyanage (Dean, Faculty of Applied Sciences),*

*Prof. Siromi Samarasinghe (Head, Department of Chemistry),*

*Dr. S.D.M.Chinthaka (Senior Treasurer)*

*Advertisement Committee (3<sup>rd</sup> year chem.. sp. students)*

*N.S. Suwandarathne, U.A. Rathnayake, B.C. Nisansala, S.A. Athukorale, S.A.S. Jayanath, K.P.S. Perera, W.R.A. Fernando, P.V.H.K. Ranasinghe, R.A.J.S. Anuruddika, A.N.K. Wickramasinghe, H.A.G. Hathurusinghe, M.G.S.M. Wijerathne, V.A.D.C. Wijethunga, K.I.D. Gomes, R.K.A. Amali, H.K.K.P. Athapattu, V.N. Gurusinghe, D.L. Abayawardhane, K.K.D.A. Wijesekara, T.L.D. Fernando & L.A.V.P.M. Manjith for their help in collecting advertisements,*

*All those companies, institutes, postgraduate programmes and all the well wishers who contributed to the publication by providing us with advertisements,*

*All the students who gave the articles,*

*Mr. W. Senadeera, member of the non-academic staff*

*Cover Page designer Janak Eshan Abeyratne*

*Printers,*

*And all the others who helped us in various ways to complete the "Crucible" successfully.*

Chemical Society  
Department of Chemistry  
University of Sri Jayewardenepura

