

lab lines

Newsletter of the Laboratory Technicians' Branch of STAV
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President's report Term 3 2007

Since the last issue of Lablines your committee has been very busy on your behalf. As you all know the staffing and conditions survey has been completed and the policy review for this has now been completed as far as committee approval is concerned. All that remains now is consultation with the other stake holders and the release of the policy. One of the more disturbing facts that comes out of the survey is the fact that in the next five or ten years the bulk of our more experienced members are likely to retire and this in turn will create a significant problem for the profession and for science education overall. Some time soon a shortened version of the policy document (the full version is rather lengthy) will be available to be published on our web site and ultimately in Lablines as well.

There have been a number of changes in the make up of the committee and I am very grateful to Darlene for taking on the role of Secretary and to Dianne for stepping into the position of Treasurer.

Much of the work done by the committee is not seen directly by members and those who have given so freely of their time and effort are deserving of all of our thanks.

It is also fitting at this time to remind all that serving your profession in taking on a role in the committee or in a region can be a very rewarding experience and is, in my view something that we should all look at taking on at some time in our careers.

LABCON this year will be at the same venue as last year and will take place on 29th -30th of November 2007. Registration books will be coming out to all registered members in due course. If you do not get one, the registration form will be available to download from the website as it was last year. I would also suggest that if you do not get a registration book it means that you have not registered this year.

It is not too late to register and the form is available on the website which can be found at <http://www.sciencevictoria.com.au/labtech.html>.

Each year we recognize the service of members who have made outstanding contributions through Distinguished Service Awards and this is based on seven or more years of service in some official capacity and is open to those who are no longer serving.

This year we will also be, for the first time presenting the Susannah Larrat award for a significant contribution to the profession. So far the committee has received one nomination and it is not too late for other nominations to be considered. Nominations are for any significant contribution to the profession by any member of LTB-STAV and nominations can be made by any member. Nominations should be in writing and signed by the nominating member and if desired the identity of the person making the nomination need not be disclosed outside the committee.

Geoff Gleadall

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Editorial

Want a life on Mars?

Mars (Greek: Areas) is the god of War. The planet got this name due to its red colour. Mars is sometimes referred to as the Red Planet.

The European Space Agency is looking for volunteers to make a pretend trip to Mars. The job will last almost two years, the living conditions will be cramped and the food all pre-packed, just as on the spacecraft that might one day take the voyage to our remote red neighbour.

"To go to Mars is still a dream and one of the last gigantic challenges. But one day, some of us will be precisely on that journey..." the ESA said. "The crew will experience extreme isolation and confinement. They will lose the sight of the planet Earth. A radio contact will take 40 minutes to travel to us and then back to the space explorers" To understand how humans might cope in such extreme conditions, ESA and the Russian Institute for Biomedical Problems have decided to sent a joint crew of six on 520-day simulated mission to Mars. "The simulation follows the mission profile of a real Mars mission, including an exploration phase on the surface of Mars", the ESA said. The project will begin with one or two shorter, 105-day studies in 2008, followed by the full 520-day study late next year or early in 2009. In all, 12 volunteers are needed.

"The Herald Sun" 2007

S.Marchouba

Lab lines deadlines for 2007 20 October 2007 for November 2007

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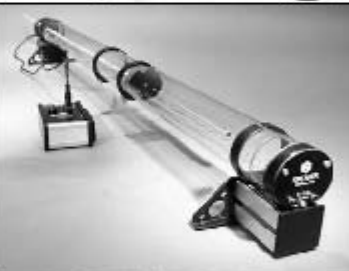
NOTE: IEC is at last designing a good, solid and long lasting DC Motor/Generator which can be used with a 'U' permanent magnet or used with the 'U' core and coils from the IEC 'Hodson' Induction Kit. Is complete with hand-driving wheel and belt. See EM1758-001 on our website for pictures and specs.



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SURFACE TENSION EXPERIMENTS

FROM THE LISTSERVE



Sprinkle enough sulphur on the surface of water in a large beaker to cover the surface. Do not use pieces large enough to sink. Invite several students to touch the surface of the water. Nothing will happen. Dip your finger in dishwashing detergent or some other wetting agent. Now, when the surface is touched, the sulphur particles will suddenly fall to the bottom.



Fill a glass (not a beaker or a disposable cup) with water. Place a square of plastic fly wire on top of the glass. Put a clean hand (free of detergent or soap) on top of the glass and invert it. When it has stabilised (no water coming out) remove your hand (important take hand away not lift the glass). Water will remain in glass.



MILK MAGIC
Full cream milk
Food dye
Detergent Bowl or petri dish

Method

Fill up bowl or petri dish with full cream milk . Place dots of food colouring around the milk ,then add a dot of detergent to the milk and watch the food colouring swirl around beautifully. It creates some gorgeous patterns.



Bubbles that do not pop. You can blow them and the land on a surface without popping...they are amazing. You could show both types of bubbles and see if they can work out what is going on.



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**Nilumbik/Banyule Region PD
13 June 2007**

Margaret leGrys and Lois O'Meara

We all know how stressful inter-personal relationships can be at the best of times, and when you toss in things like unrealistic lead times for prac orders and disagreements about responsibility for various tasks and so on, life can become fraught.



L to R Joan Miller, Thelma Lobb, Janet Thomas, Bianca Hyde, Julie Stallwood, Peter Hille, Joanne Schlegel, Clive Murdoch, Barbara Anderson.

Peter Hille came to our latest Regional meeting to talk to us about dealing with difficult people and how to say no gracefully.



L to R Wendy Stevens, Robyn Morrison, Jenny Kelly, Lois O'Meara

He covered the topic from the point of view that one must begin by deciding which issues were the most important and realising that sometimes it is more stressful to wage a campaign that can't be won than to decide to let go of an issue. A major point is to make sure that all discussions remain on a professional not personal level.

Using the acronym DACAM (Develop, Articulate, Clarify, Agree, Monitor) as a basis, strategies for gaining agreement on boundaries and monitoring outcomes as time goes by were discussed. A product of using such tools is that we become more professional, productive and team oriented.

There was much productive discussion amid laughter (which is better than tears) and anecdotes from all 15 participants. It was a two hour session, very well spent.

**Calibrating pH Meter
pH Electrode Storage
Common Mistakes With pH Measurements**

By Peter Henderson, pHentron, 2007

Calibrating pH Meter

Without proper calibration, readings are often wrong by 0.5 – 1 pH unit (it gets worse, the further from pH 7).

Always follow the manufactures recommendation. 2 point calibration is the most common (never trust 1 point calibration, some good quality pH meters can also do 3 point calibrations).

The following procedure works for meters with manual adjustable slope & offset;

1. Turn meter on & let stabilise for 20 minutes.
2. Let buffers thermally stabilise to room temperature.
3. If the meter (or electrode) does not have temperature sensing, measure the temperature of the buffers & adjust the temperature compensation on the meter.
4. Measure the pH of buffer 7, adjust the offset so the meter reads the correct pH for the buffer 7 at that particular temperature.
5. Select the second buffer, either pH 4 or 10 (sometimes pH 9.2) according to the pH of your samples (ie acidic or alkaline). Measure the pH of the second buffer & adjust the meter reading using the slope adjustment.

A good method to check the accuracy of calibration & to check the condition of the electrode, is to measure the third buffer that was not used in step 5. The result should be less than 0.1 pH unit from the true buffer value.

If slope or offset are accidentally altered, the meter should be re-calibrated. If the temperature of your samples changes – adjust the temperature compensation. Note: slope changes by 1 mV/pH per 5°C (about 0.05 pH units at about pH 4).

pH Electrode Storage

All manufactures have their own recommendation & storage solution – there are many variations to the standard glass membrane pH electrode, so follow their recommendations.

NEVER STORE ELECTRODES IN DISTILLED OR DI WATER – this will strip ions out of the electrode & shorten its life.

NEVER STORE ELECTRODES DRY.

The manufacturer's storage solution is normally the same solution as used in the reference electrode, for standard glass pH electrodes this is normally 3 M KCl (or 3 M KCl saturated with AgCl, for a Ag/AgCl reference electrode).

Short term storage, stand the electrode in the storage solution or pH 7 buffer. If the electrode is giving a sluggish response try storing it over night in pH 4 buffer or pH 10 buffer (the opposite value of the pH you normally measure).

Over night & for longer storage, replace the cap on the refill opening.

Long term storage – place a few drops of storage solution in the storage cap (a plastic cap that fits over the glass membrane – supplied with new electrodes). I also like storing the electrode vertically, so the internal electrolytes stay in the membrane end.

Common Mistakes With pH Measurements

Open the cap on the refill opening, before making any measurements or calibrating (failure to open the cap will cause results to drift & often blockage of the junction).

Before making any measurements, check there is sufficient filling solution to cover the wire in the reference part of the electrode. The height of this liquid must also be above the height of the sample being measured, to give a very slight flow of this filling solution out of the electrode (this also helps to prevent contamination of the filling solution).

Calibrate the meter at least daily (follow the manufacturers recommendations).

Some meters will need to be re-calibrated if they have been turned off (particularly older ones). Also re-calibrate if the electrode is changed.

Contamination of the electrode can occur with some solutions, especially if it contains fats, oils or proteins – follow the manufacturers' recommendations. Also, solutions containing sulphides, hydrofluoric acid or high concentrations of halide can cause problems.

Always wash the electrode with distilled water after every measurement.

Never store the electrode in distilled or D.I. water (see earlier articles).

Stir the sample when making measurements.

Most poor measurements are due to problems with the electrode. Other causes of poor measurements are calibration errors due to bad techniques, not compensating for temperatures, then contaminated buffers. The least likely fault is an electrical problem with the pH meter.

**SCIENCE INTERNET SITES USED BY
LABORATORY TECHNICIAN. By Bob Norton.**

- (1) Safety School website. www.sofweb.vic.edu.au/hrm/ohs/accpreu/hassubs.htm
- (2) Compliance Guidelines for Schools can be obtained from website:-
www.eduweb.vic.gov.au/hrweb/ohs/accp/comply.htm
- (3) Occupational Health and Safety (Hazardous Substances) Regulations are available from Information Victoria, tel 1300 366 356 or from the internet at
www.dms.dpc.vic.gov.au
- (4) NOHSC Standards, Codes and Guidelines.
(National Occupational Health & Safety Commission) can be obtained from
Website: www.nohsc.gov.au/OHSInformation/NOHSCPuplications/
- (5) Sofweb site. www.sofweb.com.au
- (6) D.E@T Intranet site. www.eduweb.com.au
- (7) Edusafe site. www.edusafe.edu.au
- (8) Hazardous substances regulations site. www.ascc.gov.au
- (9) Department of education and training site. www.education.vic.gov.au
- (10) Codes of practice. /Risk Assessment etc site. www.workcover.vic.gov.au
- (11) Online Standards site. www.saiglobal.com.au
- (12) Australian standards site. (1) <http://prms21.eduweb.vic.gov.au>
" " " (2) www.standards.org.au
" " " (3) www.standards.com.au
- (13) Radioactive substances in schools site. www.sofweb.com.au
- (14) Chemwatch site. www.eduweb.vic.gov.au
- (15) Noel-Arnold and associates. www.noel-arnold.com.au
- (16) Occupational Health and Safety Regulations. www.dms.dpc.vic.gov.au
- (17) Generic MSDS site. www.hazard.com
- (18) Education channel cache site. www.education.vic.gov.au
- (19) Environment Protection Authority. www.epa.vic.gov.au
- (20) Lab tech list server. Ltb-stav-list@platypus2.wesleycollege.net
- (21) (21) Chemsal site. www.chemsal.com.au
- (22) Envirochem site. www.envirochemtech.com.au
- (23) State supply site. www.statesupply.com.au
- (24) Westlab supply site. www.westlab.com.au
- (25) Southern biological site. www.southernbiological.com.au
- (26) Livingstone international online. www.livingstone.com.au
- (27) Haines educational site. www.haines.com.au
- (28) Wiltronics site. www.wiltronics.com.au
- (29) Science supply site. www.ssapl.com.au
- (30) Dynamic science education www.dynamicscience.com.au
- (31) Chem-supply site. www.chemsupply.com.au
- (32) Dick smith electronics site. www.dse.com.au
- (33) Occupational Health and Safety Signs. www.stclair.com/go/industrial_signage/ssb_danger/html

DO IT YOURSELF

Please send in your ideas.



Storage container for the IEC air table kit:

(makes it very easy to check at the end of the class for the missing pieces)

Plastic container 32 x 32 cm square, or similar

Photocopy of pucks (I have photocopied the real pucks, laminated the paper and used double-sided sticky tape to attach the shapes to the container)



Cup hooks (small) for the brass discs and the springs

Tin Chloride Solution

HANDY HINT FROM LISTSERVE

Dissolve 56g of Tin (II) chloride -2-water in 100cm³ of concentrated hydrochloric acid and dilute to 1 litre with distilled water. The solution may be preserved by adding a small amount of metallic tin to the stock bottle.

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Let there be Light

S.Marchouba, Camberwell Grammar School

The inefficient standard light bulb could be phased out within three years to save up to 800000 tones of greenhouse gas emissions. Australia was not the first with the idea. Last month legislators in California proposed a "How Many Legislators Does it Take to Change a Light bulb Act" that would phase out incandescent light bulbs by 2012 in favor of compact fluorescent bulbs. In Australia lighting represents about 12 per cent of greenhouse gas emissions from households, about 25 per cent of commercial sector emissions, and a quarter of the emissions associated with public and street lighting.



	Incandescent light bulb	Compact fluorescent light bulb (CFL)	Light emitting diode (LED)
Cost	\$1	\$5	\$20
Lifespan	1000 hours	8000 hours	50000 hours
Illumination	100 W	20 W	6 W
Power used (equivalent time span)	50 x 100W x 1000hours = 5000 kWh	6.25 x 20W x 8000hours= 1000kWh	1 x 6 W x 50000hours = 288 kWh
Total cost (equivalent time span)	50 globes x \$1.00 = \$50.00 5000 kWh x \$0.15 = \$750.00	6.25 globes x \$5.00 = \$31.25 1000 kWh x \$0.15 = \$150.00	1 globe x \$20.00 = \$20.00 288 kWh x \$0.15 = \$43.20
Total	\$800	\$181.25	\$63.20
Summary	Incandescent light bulbs were first developed almost 125 years ago. incandescent bulbs convert less than 10 percent of incoming energy into light (90 % of the energy it uses is wasted in the form of heat)	CFLs convert 18 to 20 percent of incoming energy into light. By using just one 15-watt compact fluorescent bulb instead of a 75-watt standard bulb you can save about \$10 a year on your energy bill. Like other fluorescents, they contain a pollutant, about four milligrams of mercury per lamp. Compact fluorescent bulbs pay for themselves within 12 months.	LEDs have 40% conversion rate, without mercury or other contaminants. LEDs have been used for years, primarily in the electronics industry for circuit board mounted indicator lights. Increased performances (brightness), lower production costs and the availability of a variety of colors have led to the successful use of LEDs in replacing incandescent lamps found in architectural, commercial and industrial applications.

Reference:

1. *Smithsonian*; May2007, Vol. 38 Issue 2, p22-27, 4p
2. *National Sustainability Centre at the University of Ballarat.*

Solar Cell Investigation

Dr.M Anderson
Camberwell Grammar School

Introduction

There is increased interest in solar cells as a means of generating electricity from a renewable resource with negligible pollution. This practical exercise investigates the realm of possibilities for a small solar cell and introduces you to further developing your skills in more open-ended experimental research, interpretation of the data collected and the use of spreadsheets to store and analyse data.

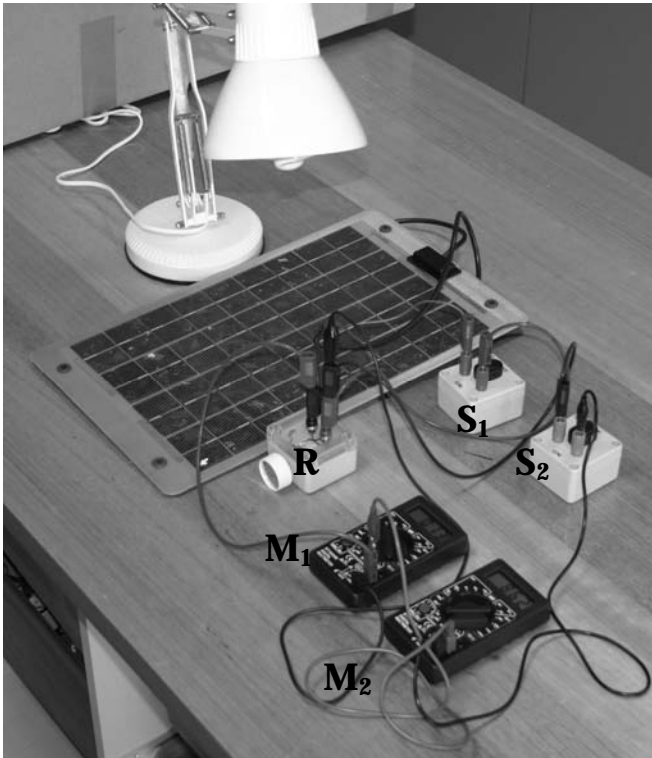


Figure 1 depicts a circuit for investigating the power output of a solar cell as the load resistance and hence current is drawn from the solar cell. You will be measuring the voltage across the cell and the resistance of the load. From these measurements you will determine the current generated in the load resistor and the power absorbed by the resistor from the solar cell.

S₁ switch 1
S₂ switch 2
R variable resistor
M₁ multimeter (Volts)
M₂ multimeter (Ohms)

Figure 1

Procedure

1. Connect up the circuit as shown in Figure 2 with both switches open and light source over head.
2. Set the multimeter to the 20 volt setting to measure the voltage across the solar cell when **only switch 1 is closed**.

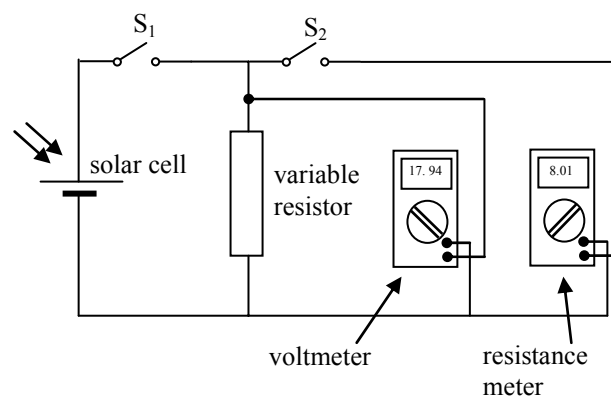


Figure 2

3. Set the other multimeter to the 20 kΩ setting to measure the resistance of the variable resistor when **only switch 2 is closed**. You are given a variable resistor which ranges from 0 Ω to about 10 kΩ and can be varied by rotating the dial.
4. With switch 2 closed adjust the dial on the variable resistor to obtain a maximum value.
5. Now open switch 2 and close switch 1. This connects the known resistor to the solar cell.
6. Record both the resistance in kΩ and the voltage across the resistor [and hence the solar cell] in the table below. You should repeat this several times after systematically lowering the resistance until the resistance is about 0.25 kΩ (250 Ω). The first row has some fictitious data in Columns A and B and instructions on how to generate Columns C to F.

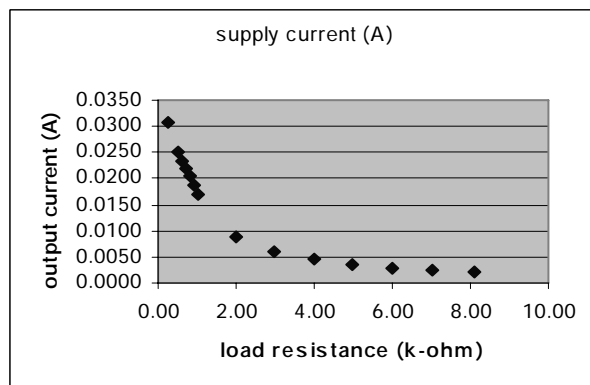
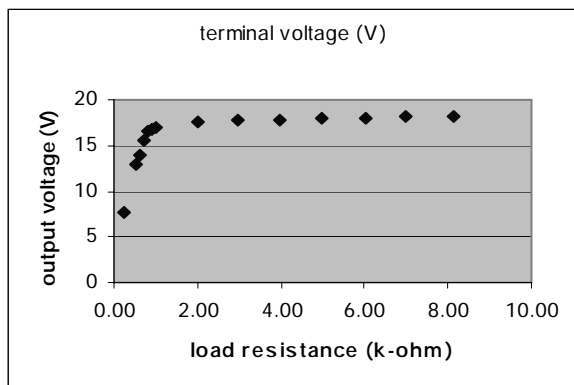
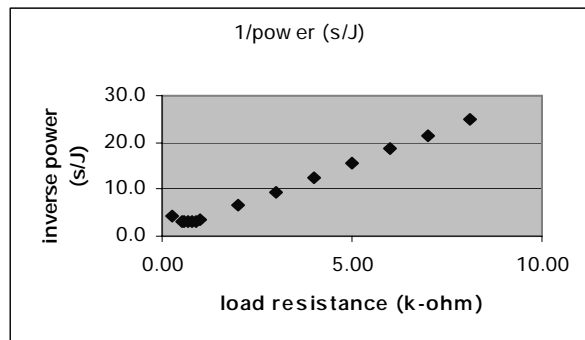
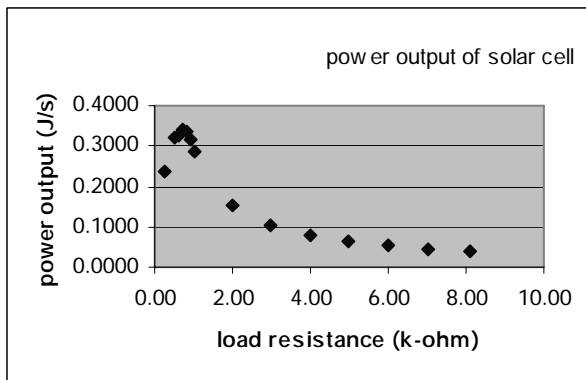
Column A	Column B	Column C	Column D	Column E	Column F
Resistance	Voltage	Current	Power	1/Power	1/Power
(kΩ)	(V)	(mA)	(mW)	s/mJ	s/J
9.5	17.98	=B2×1000/A2	=B2 × C2	=1/D2	=E2*1000

A number of graphs can be now drawn to investigate the performance of the solar panel when the load resistor is varied.

Here are some possibilities:

Column B versus Column A: this will show how the voltage varies when the load resistance is decreased. How might you interpret these results?

Likewise a plot of Column D and A gives the power delivered versus the load resistor: this could reveal under what circumstances the solar cell is most suitable..



In reality the idea of maximising the power output of a solar cell is a little more complicated than simply choosing a load resistance. It is more a case of trying to match the characteristics of the solar cell array to the demands of the application. Each arrangement or type of solar cell will have a different optimum load resistance, thus suiting different applications.



COMICS

© You see, wire telegraph is a kind of a very, very long cat. You pull his tail in New York and his head is meowing in Los Angeles. Do you understand this? And radio operates exactly the same way: you send signals here, they receive them there. The only difference is that there is no cat.

Albert Einstein

© Few people are capable of expressing with equanimity opinions which differ from the prejudices of their social environment. Most people are even incapable of forming such opinions.

Albert Einstein

© Gravitation cannot be held responsible for people falling in love. How on earth can you explain in terms of chemistry and physics so important a biological phenomenon as first love? Put your hand on a stove for a minute and it seems like an hour. Sit with that special girl for an hour and it seems like a minute. That's relativity.

Albert Einstein

© Nail in experiment

During my freshman biology class at North High School in Springfield, Ohio, our teacher was lecturing on the conditions in which bacteria exist. Elaborating on the acidic environment where bacteria thrive, he suggested a simple experiment. "I want you to drop a nail into a glass of Coke or Pepsi, and then observe the acidic reaction on the nail," he said. The girl sitting next to me raised her hand and asked in all seriousness, "Do you mean a real nail, or a press-on?"

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Technicians from the Waikato and Bay of Plenty Regions in New Zealand invite you to join them for the biennial School Science Technicians' Conference.



Why should you be at SCITECH 2007?

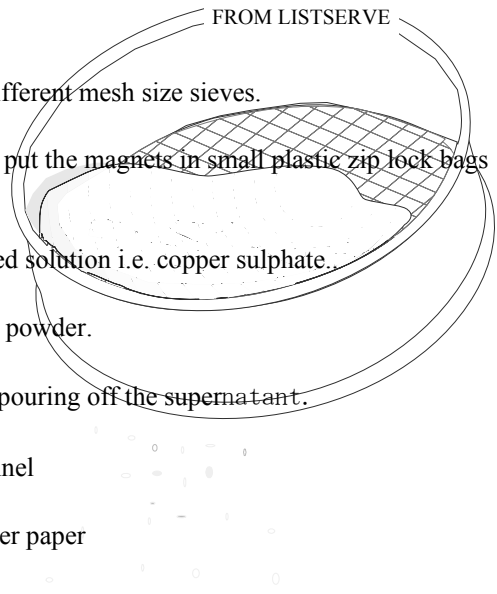


- ❖ **STANZ-** Attend the first national AGM of the Science Technicians Association of New Zealand. This is your chance to support your association and vote on the election of officers.
- ❖ **Informative Speakers-** Keep up to date on issues important to science education.
- ❖ **Professional Development-** Increase your skills with a wide range of workshops chosen by technicians for technicians.
- ❖ **Network and Socialize-** Conference dinner with a twist. Catch up with old friends, meet new people and develop valuable support networks.
- ❖ **Fieldtrips-** To showcase the beautiful Waikato and provide ideas to support educational trips in your own area.

Mark these dates on your calendar- we hope to see you for an enjoyable, informative time. More information and registration cost will be posted on the STANZ website and Scitech talk as soon as possible to help with your budgeting. If you would like to contact us post a note on Scitech talk or email the conference conveners:
Rleone@stishms-hamilton.school.nz NLee@hillcrest-high.school.nz

Separating Mixtures

- Course and fine sieving: pasta, lentils and sand: use two different mesh size sieves.
- Magnetic separation : sand and iron filings in Petri dishes: put the magnets in small plastic zip lock bags for ease of removing the filings.
- Distillation - Demonstration for distillation using a coloured solution i.e. copper sulphate.
- Centrifuging: use cocoa for this process as it is a nice fine powder.
- Decanting : soil and water—allowing to settle and simply pouring off the supernatant.
- Oil and water in a container and give them a decanting funnel
- Filtering - Sand and water or anything insoluble- using filter paper
- Evaporation - Salt and water – evaporating dishes



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LTB-STAV 2007 Conference

29-30 November

What's on

SCITECH 2007 CONFERENCE NEW ZEALAND

3-5 October

10 Things I liked about CONASTA

Lois O'Meara ELTHAM College of Education

CONASTA 56 – Annual Conference of the Australian Science Teachers Association in Perth 8 – 12 July 2007. This year incorporated with the WSTE - World Science and Technology Education Conference.

Major Themes: Sustainable – Responsible – Global

- World Health (including AIDS, malaria, other diseases and health challenges such as clean water)
- Education for Sustainable Development, as part of the UNESCO World Decade of Education (2005-2015)
- Science for Life and Citizenship
- The Way Forward (educational directions and priorities established by International Council of Associations for Science Education)

1)Tuesday 10th July Laboratory Technicians Focus Day

The keynote speaker was Chris Peel who works for CLEAPSS, a school science service in the UK which provides information and advice on laboratory safety and science resources. With over 30 years experience as a Science Technician, Chris now works for CLEAPSS which supports practical science and technology in schools and colleges. He produces written publications, answers questions via phone and email helpline and provides one day practical workshops. Advice may relate to purchasing apparatus, health and safety matters, disposal of chemicals, risk assessments and lab design. He also has been involved giving evidence to the House of Commons Select Committee on Science and Technology regarding the importance of School Science Technicians and their impact on science education in the UK. Chris gave us a real insight into 'best practice' in the session 'Running a Prep Room – Making it Safer and More Efficient. We were lucky enough to get copies of some of the CLEAPSS publications, Running a Prep Room, Running a Prep Room - Documents and Induction and Training of Science Technicians.

2)Session: Sing a Little, Play a Little, Laugh a Lot -Learning in Science Can Be Fun

Merrin J. Evergreen and Ranjith Dediwalage, St Leonards College.

The session began with "You'd better watch out! You may learn something while you are having fun! This song writing workshop uses 'gluing' difficult scientific concepts to nursery rhymes and popular songs. Merrin writes the 'Quest' series of science books and uses this workshop with her senior biology students.

Outline of the process:

- Given a chunk of information to process.
- Find the key scientific terms.
- Visual thinking tools were used to mind map connections.
- A nursery rhyme or other popular song was selected.
- Possible rhyming words to the key terms were brainstormed.
- Songs were created and shared.

I was a member of a group of 4 participants who wrote the following song:

(To the tune of 'I'm a Little Teapot') and with actions.

Let us introduce the synchrotron
It has a gun that shoots electrons

With magnets in a circle, they accelerate
Electric fields make them faster and gain weight
The synchrotron can be quite bright
As the accelerating charge radiates light

We certainly did 'laugh a lot' during this session and hopefully we learnt lots as well.

3) Conference Dinner

The conference dinner was held in the Golden Ballroom of the Sheraton Hotel in Perth. With more than 1000 delegates from 50 nations at the conference, I estimate that over 800 attended the dinner. The food and wine were fantastic and the entertainment consisted of a floorshow of a singer and four dancers and later a band that kept us all 'dancing all night long'. It was great to see all the delegates up on the dance floor and having a good time. It gives everyone a chance to 'glam up' and some delegates wore their very colourful national costumes. We got to enjoy each others company in a social setting and is an event not to be missed if you ever have the chance to attend a CONASTA.

4) Keynote Speaker: Professor Lord Robert Winston

Lord Winston is Professor of Fertility Studies at Imperial College School of Medicine London and heads the Department of Reproductive Medicine at the Hammersmith Hospital in London. He is well known throughout the world for several of his BBC television series, which include The Human Body, Secret Life of Twins and Super-human. Lord Winston spoke about the 'failure' of universities to link science with communication skills and ethical and commercial imperatives. Lord Winston likes to be known as a scientist and science communicator and so he encouraged science educators to attract students into science first and then into science teaching. His closing statements touched on the need to properly reward science educators, the lack of adequate technicians in schools and its impact and the issue of young teachers entering the profession with high debts.

5) Meeting so many interesting people in 4 days

WOW!!!! What an Experience. Totally exhausting physically, but invigorating mentally.

Chatting to the Senior Curriculum Developer in Maths and Science from the Netherlands and catching up with an expert on gifted and talented students from the University Of Waikato, New Zealand, who I first met in Melbourne at CONASTA 54, were just two examples. Also realizing that no matter what country, state, type of school, type of location, that laboratory technicians are employed in, our jobs are basically the same and therefore so are our problems and stresses. If we share our knowledge and help each other out, whether on a small scale or on a larger one, we are all going to benefit.

6)Keynote Speaker: Professor Barnabas Ojala

Emeritus Professor Ojala specialises in HIV/AIDS and Early Childhood development. He was most recently Head of the Unit for Improving Teaching and Learning and Chairperson of the HIV/AIDS Task Force of the University of Namibia. He is also now Adjunct Professor at the International University of Management, Windhoek, where he teaches at the HIV/AIDS division.

His address outlined in detail the HIV/AIDS challenge confronting schools, universities and communities in the Sub-Saharan African region. His solution consisted of 3 elements: education, education and education. This address brought home the seriousness of the HIV/AIDS problem and as a questioner pointed out, a problem that is on our doorstep too.

7) Stanhope Oration: Dr Graeme Pearman

The Climate Change Challenge: From Science to Action.

Dr Pearman is a national and international expert in research on the increasing levels of carbon dioxide in the global atmosphere. After 30 years at CSIRO, including 10 years as Chief of the Division of Atmosphere Research, Graeme established his own consultancy company and took up a position at Monash University. His presentation began with a brief history of our awareness of the relationship between greenhouse gasses and climate that began 150 years ago. In the mid 80's Dr Pearman became involved in the communication of planetary warming to the wider scientific and lay community via the Australian media's attention to the 'greenhouse effect'. It has taken until this decade and here in Australia, this year for the issue of human influence on greenhouse gases and climate change to come to the fore in the media, political positioning, industrial and commercial risk management.

8) Making Effective Use of Do-It-Yourself Science Kits

Fiona Mayne, Rosemary Evans, and Leonie Rennie Curtin University of Technology.

DIY Science Kits were designed to support educators throughout Western Australia by making available the necessary resources to bring science to life for their students, no matter how remote. The kits contain all the equipment and resources required to conduct a series of lessons, experiments and investigations around a set topic.

Some of the topics were Light, Sight and Sound, Weather, Magnetism and Electricity, Body in a Box, Astronomy, Dino Science, Photonics and coming soon Earth Science and Forensic Science. The kits come complete with the required materials, background notes, complete instructions and reproducible resources. They are easy to assemble and portable. These kits encourage minds-on as well as hands-on science education. I got some great ideas that I can use at my P-12 school. From kits for the Grade 3 and 4 Centre or even for Photonics in Senior Physics.

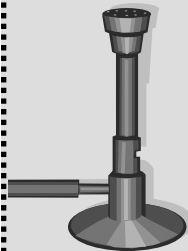
9) Cosmetic Chemistry

I was very nervous before my presentation especially when I had to have a 'bouncer' on the door to stop people from trying to get into the already full session. (Thanks Julie from WA). My workshop for lab technicians, managers and teachers includes the history of soaps, cosmetics and aromatherapy as well as simple recipes for hand cream, bath bombs, soap, lip balm, body scrub, cold cream and toothpaste. Included are lots of helpful hints on how to make them with as little mess and washing up as possible and a list of suppliers, references and web addresses. The hands on component uses ingredients found at the supermarket and the emphasis is on natural products with no artificial perfumes, dyes or other petrochemicals which are biodegradable, vegetarian, allergy free and safe on sensitive skin. I do not use any laboratory equipment so the class can be conducted in a general purpose classroom. I also look at the simple chemistry concepts of soaps and emulsions. The program is student centred, while developing cooperative and collaborative skills, working together to produce, promote and market their products. The session can be included into year 9/10 Consumer Chemistry, Cosmetic Chemistry or simply as a health and well being session or end of year activity for Year 3 onwards. The session was well received and the best part was at the end when all the technicians helped me clean up and pack all my gear away. Lab Techs Rule!!!

10) All the things I couldn't fit in to the previous nine.

- Perth Zoo. We did a behind the scenes tour of the breeding program of several endangered species and visited the reproductive medicine area including the artificial insemination program centre.
- Tour of the Swan Valley near Perth.
- Laboratory Technicians Dinner hosted by Marilyn Miles and Therese Gigengack who were the two lab technicians on the organising committee of this incredible conference. Well done ladies!!!
- ‘Step Back in Time’ Disco at the Sheraton. Although I remembered all the songs quite clearly, the 70's and 80's seem just like yesterday to me.
- ‘Tastes of Western Australia’ Happy Hour. Great food and wine from the west.

See you next year at CONASTA 57 – Surfing the Wave of Change on the Gold Coast, Queensland July 6-9 2008. If you are thinking about presenting a session and would like a bit more information, I would love to catch up at LABCON or you can email me on lomeara@elthamcollege.vic.edu.au



Cleaning Bunsen Burners

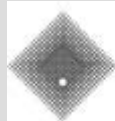
HANDY HINT FROM LISTSERVE

- Dismantle and soak the whole lot in hot water with detergent.
 - Scrub and wash all and use a fine copper wire (will not enlarge the brass jet) to gently clean any grunge out.
 - Dry in a lab oven at 130 degrees (this will remove any traces of wax)
- Reassemble, and add a hose and test, for any that still do not work. Repeat the above steps and if they fail a second time throw away as repair by a gas fitter will cost more than their worth.

LABORATORY TRAINING FOR THE WORKPLACE

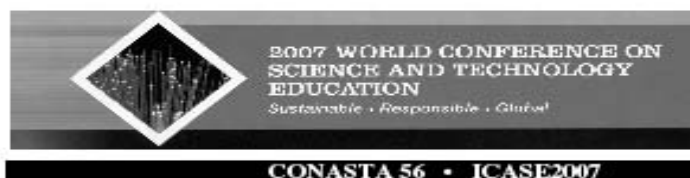
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The Perth Declaration on Science and Technology Education

We, the participants at the 2007 World Conference on Science and Technology Education, held in Perth, Western Australia, 9 - 12 July 2007, and comprising more than 1000 science and technology educators from 50 nations worldwide; believing in the importance of science and technology for sustainable, responsible, global development, and in the need to bridge the gap between science and technology and the public.

Express concern at the lack of recognition of science education as a vehicle for meeting national educational goals, and social and economic needs;

Observe a widespread lack of student interest in current school science and technology education and of its relevance to them;

Note the shortage in many countries of specialist teachers of science and technology;

And consider that the rapid changes taking place in science and technology and their applications must be reflected in the planning, teaching and learning of science and technology.

Resolved to recommend to Governments:

- To promote critical awareness of the contribution of science and technology to personal, social, economic and environmental wellbeing through building partnerships with national stakeholders and the media;
- To initiate revisions of the curriculum for school science and technology that will increase student interest in and recognition of the roles of science and technology in society;
- To promote from the primary years onwards the career opportunities that stem from the study of science and technology;
- To recruit graduates into science and technology teaching and to value, support and retain them with appropriate rewards;
- To resource and promote continuous, effective professional development for science and technology teachers in order to meet changing student needs and societal aspirations;
- To recognise and support the significant role of teacher associations in building a quality professional learning community for science and technology;
- To resource the development of relevant and effective assessment processes so that learners achieve essential life skills, meet academic and vocational standards and personal aspirations;
- To engage in greater international cooperation to ensure the provision of well-trained science and technology teachers to meet current and future challenges;
- To call on UNESCO to integrate its science and technology education endeavour as fundamental to achieving educational, environmental, cultural, social and sustainable development goals.

We, the participants, are committed to ensuring that students are scientifically and technologically literate and able to contribute to sustainable, responsible, global development in their respective nations.

How long can you keep make-up solution???

LISTSERVE, Bronwyn Duncan

Some solutions will last for years but some need to be made fresh.

Ammonia solutions, sodium carbonate, sodium thiosulphate some iron solutions and some NaOH solutions are examples.

Others have an obvious shelf life (like starch and glucose solutions).

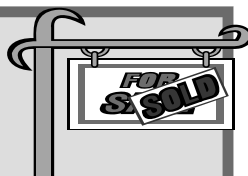
Some of the things to look for regarding the integrity of your solution are evaporation, colour fade, colour change, precipitation of chemical, microbial contamination, change of pH and most importantly is the desired chemical reaction still occurring?

It would depend on what you want to use the solution for when it comes to filtration. If you are filtering because of precipitation your concentration will have altered or another product entirely has been produced. If it is because you have mould or bacterial contamination, I would say its time to fling it.

For Sale

This space is available for any school Laboratory Technician to advertise, free of charge, anything they would like to sell on behalf of their school.

Please contact the editor,
Svetlana Marchouba on sm@cgs.vic.edu.au



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- **Molecular Weight:** 28.01
- **Boiling Point @ 1 atm:** -195.8°C
- **Freezing Point @ 1 atm:** -210.0°C

Some precautions to take into consideration. Do The Risk Assessment!

- *BOC is the supplier and hire dewars. \$3 per litre and hires about \$20 for container.
- *Must be carried in open vehicle (windows down doesn't count) due to expansion of liquid to gas and as heavy will fill the vehicle you are in and suffocate. To order a 10litres Dewar (total cost \$137.50) from liquid nitrogen services, Phone 9782 2646. They deliver and pick up.
- *Good thermal gloves (long welders gloves).
- *Face shield and not just glasses in case of splashes.
- *Transfer into foam eskies for classroom work.
- *Use metal tongs to put stuff in and out of liquid.

Demonstrations

- Flowers lettuce leaves or any plant material full of water works really well. You can crumple it in your hand.
- Paper doesn't have enough liquid in it to freeze.
- Smashing rubber can be done but make sure it is done behind a perspex screen as pieces will go everywhere and as frozen can cause cold burns. Also those pieces do tend to get sticky once thawed.
- Tennis balls work well though need to leave in for a while.
- Bananas also take a fair time in liquid to set hard.
- Left over liquid can be thrown along carpet to create instant fog very cool. (don't pour it all in one spot as may damage the carpet.)
- "Cook" an egg - looks fried when frozen but thaws again to raw! (can talk about denaturing proteins)
- Make the ice-cream!





WHAT IS IT?

Do you have a piece of equipment you have never used and want to get rid of (or simply to find out what it is).

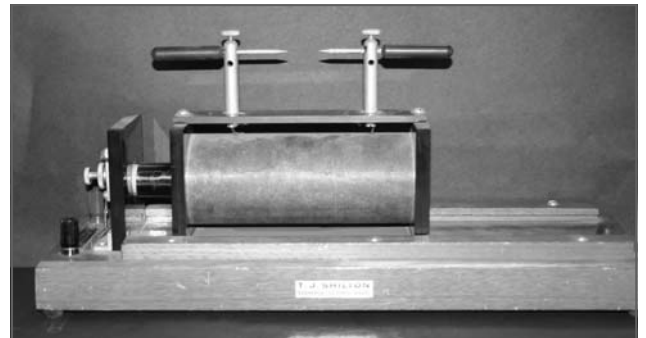
Just take a photo of it and send it to sm@cgs.vic.edu.au
We will help.

An **Induction coil** or "spark coil" (known as a **Ruhmkorff coil**) is a type of disruptive discharge coil. It is a passive electrical device used to produce high-voltage pulses from a low-voltage DC supply. (Wikipedia)

The induction coil was discovered during early experiments with electricity, by Nicholas Calla in 1836 and further refined by Heinrich Ruhmkorff and others.

Setting up and Using The Induction Coil.

1. Make sure the contacts are clean and free of carbon deposits. If not, clean them with fine sand paper.
2. Use the screw to adjust the gap between the contacts so there is a very small space between them, and when turned on, there is a continuous oscillation and a spark between the contacts. (Turn the power off before readjusting the screw.)
3. Make sure that the induction coil is connected only to 6V DC.
4. Connect the positive terminal of the induction coil to the positive terminal of the DC supply and the negative to the negative terminals similarly.



ELECTRICAL SAFETY

The risk of harm from an electric current flowing through the body depends on many factors including:

- Magnitude of current
- Current path
- Duration
- Environmental conditions
- Nature of current (ac or dc, frequency)



Some of these factors are inter-related. For instance current magnitude depends, to a certain extent, on the path taken by the current through the human body, skin contact area, tightness of grip, dryness of skin, cuts, etc. Educational power supplies are generally classified as LT, HT, or EHT, depending on their voltage outputs and whether or not they are current limited.

Power supply type	Voltage output	Current output	Hazard
LT (Low Tension)	25 V maximum	<9 A	Generally no risk of electric shock except in applications with inductors Risk of burns or fire
HT (High Tension)	Generally 400 V maximum	Unlimited Maximum values typically lie between 80 mA and 400 mA	Hazardous live Risk of electrocution
EHT (Extra High Tension)	5 kV	5 mA absolute limit Typical maxima are 2 mA or 3 mA	Either outwith, or just inside, the hazardous live regime Risk of harm is unlikely

Ref: SSERCC Safety Net



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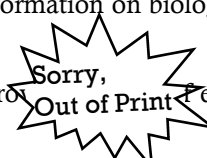
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- **LABCON 2001-2006 CD-ROMs:** \$15.00 (incl. GST and postage). Limited numbers of the conference CD-ROMs are available. The CD includes all session notes by presenters and other information.
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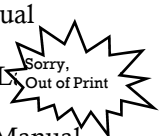
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Please feel free to contact any member of your committee with any queries or concerns. Members are welcome at committee meetings. Contact The Secretary for more information.

LTB-STAV Committee Meeting Dates 2007.

Committee will meet at 5 Munro Street, Coburg from 6:30 – 9:30 p.m. on the following dates:

11 September, 7 November

All members are most welcome to attend.