

Space the Final Frontier



Bob Sheppard, P.Eng., Director

On September 24, 2007 at 7:00 AM, one of two Canadian space science experiments were launched on a Russian Foton M3 recoverable satellite from Baikonur Cosmodrome in Kazakhstan. The satellite carried a total of 35 life and physical sciences experiments mostly from the European Space Agency.

Technical Services did machining and water jet work for the electronics enclosure, under the direction of C-CORE for one of the experiments that will make it easier to determine the quantity and quality of oil in a given well without breaking ground.

The experiment is expected to help improve the efficiency of oil extraction with related benefits to the Canadian industry- the Alberta tar sands and offshore oil.

Glassblower Shines Again



Schlenk Vacuum Line for Dr. Chris Kozak

This item of glassware was requested from our Scientific Glassblower by the Green Chemistry and Catalysis Group in the Chemistry Department. It is a dual manifold high vacuum line with some special modifications. Vacuum lines are used in the preparation and handling of catalysts, which can be used to reduce the energy required in a particular chemical process.

These processes include the production of new plastics and pharmaceuticals. Because most catalysts are very reactive materials, which will not tolerate the presence of even one part per million of water or oxygen, they require highly specialized equipment to prevent their decomposition.

For example, some catalyst materials are pyrophoric and spontaneously catch fire if exposed to the air. They must, therefore, be handled in controlled atmospheres such as under inert

gases like nitrogen or argon, or even under high vacuum.

A Schlenk line is of vital importance to many researchers in our group, but this piece of equipment has added features not seen on other lines. It certainly is not something that could be purchased readily from the usual glassware vendors and requires a great deal of skill to make.

The system consists of two glass manifolds, which are in turn divided into two chambers. These four separate manifolds are connected using several Teflon stopcocks or valves. In this example, all-Teflon valves and O-ring joints have been used to ensure a good vacuum seal and easy maintenance.

The front manifold is connected to an oil diffusion vacuum pump, which is used to remove air from reaction vessels. Under full operation conditions, this high vacuum line assembly can attain an ultimate vacuum of ca. 10^{-7} mm Hg of pressure.

The two back manifolds are connected to supplies of gases; nitrogen is used for "blanketing" reactive materials during handling, while reactive gases such as hydrogen, carbon monoxide, etc. can be added to reactions under controlled pressures.

The gas supplies are connected to paraffin oil bubblers with check valves that maintain a gas pressure of 5 psi about atmospheric pressure,

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and prevent sucking back if a negative pressure is exposed to the gas supply manifold.

Manometers and pressure gauges can also be attached to the line to accurately measure the amount of gas added to a reaction. Having several ports on the line is convenient because more than one reaction vessel may be attached to the line at the same time. Also, specialized connections allow for items such as NMR tubes to be attached directly to the line. This allows complete degassing of NMR samples and the addition of solvents and volatile reagents by vacuum transfer without exposure to the outside atmosphere.

Although Schlenk lines make it easier to perform chemistry on air- and moisture-sensitive substances, there are still hazards when using them. It is important that they are well made and that users are well trained as there is always the risk of the line imploding (because of the vacuum) or exploding (because of incorrect gas pressure).

Dr. Chris Kozak Chemistry

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Biomedical Conference

Eastern Health and Memorial University will be hosting the Thirteenth Annual Atlantic Clinical Engineering Seminar next spring. We are very excited

about this opportunity and are looking forward to sharing our Newfoundland culture with our Atlantic Canada colleagues. We are expecting over 150 biomedical professionals to attend plus almost fifty medical manufacturers. We will be developing a number of seminar and training sessions over the coming months. So far we have Dr. Kok-Swang Tan, Medical Devices Bureau, Health Canada, who will be discussing electromagnetic interference from wireless technologies. We will keep you updated as this evolves.

Staffing Changes

We are pleased to welcome new staff - Ted Lee in our Electronics Division; Ron Monks in our Mechanical Division. We also would like to congratulate Adrian Johnson and Kelly Spencer on their new jobs and thank them for their many years of dedicated service with Technical Services.

Staff Achievements

Congratulations to the following:

Chris Lee - for obtaining his B. Tech. in this fall's convocation. Chris is planning to start a Master's program in Labor Relations this winter.

Wade Hickey - for earning the Certificate Member Specialist Certificate credential in the Refrigeration Service Engineers Society (RSES). Only 3% of the

current RSES members have achieved this credential.

Silent Auction Coming



Our big Silent Auction is planned for **November 22, 2007** in Atrium of the Arts Building and the Medical School main cafeteria area at the Health Sciences Centre. Both auctions will feature some very unique handcrafted items such as Harry Potter's magic wand, pesky mosquito shooters, glass blown ornaments, beautiful mantel clocks, crib boards, golfing gifts as well as a wide variety of new and exciting items this year.

This will be a great opportunity to pick up some very unique Christmas gifts – handcrafted by our staff. Many of the items will be listed on our web site at <http://www.mun.ca/ts> before the auction. Funds go to support our two scholarships for MUN students.

Comments to:

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