MAINTAINANCE OF GAS AND LIQUID NITROGEN SUPPLY

Jeff Bahr 7 September 2001

There are two responsibilities here: maintaining supply of nitrogen gas for the labs and maintaining a tank of liquid nitrogen for use in traps etc.

Gas Supply:

Nitrogen gas is supplied by boil-off from liquid nitrogen tanks stored in the hallway closet outside Rm. 260. There is an automatic changeover manifold to which four cylinders can be connected. The rate of usage varies dramatically depending on work-load, any valves left open in the labs, amount lost to venting etc. You will have to develop an intuition on this, and the labs may run out a time or two while you are figuring this out. Start with the assumption that one full tank will last about two days. However, don't run the system with just one tank. Always endeavor to have a full complement of tanks on the manifold, at least two of which have a decent supply of liquid. Typical total stock is 8 tanks, in varying stages of depletion.

DO NOT PAY MUCH ATTENTION TO THE RED AND GREEN LIGHTS EITHER IN THE LAB OR IN THE CLOSET…TANK CHANGING SHOULD BE DICTATED BY YOUR KNOWLEDGE OF HOW MUCH LIQUID/GAS IS LEFT IN THE CYLINDERS…THIS IS BEST DETERMINED BY WEIGHT, AS THE GAUGES ON THE CYLINDERS ARE OFTEN MISINFORMED. GET A FEEL FOR HOW MUCH IS IN A CYLINDER BASED ON ITS WEIGHT.

Order tanks four at a time unless more is needed. Delivery is usually next day if you get your order in by 2:30 PM. Invariably, next-day delivery will not happen on occasion….be prepared for this eventuality. The procedure for ordering is as follows: Bookmark the order website (URL is on the example)…fill in the blanks as shown in the example following this description. The cylinder type for gas use is PG45. Click submit at the bottom of the page. Tom Blakeney handles these orders when he is in town (blakeney@rice.edu). Email him with any questions, complaints, or to report broken or inoperable cylinders (do this ASAP after receiving them!). The delivery driver will deliver the cylinders some time during the day and will remove the empties. The driver does not normally install cylinders on the manifold…he will if specifically requested, but do not do this on a regular basis. KEEP THE DRIVER HAPPY….he can help you when something goes wrong or you need an extra cylinder etc.

The normal cylinders have pressure relief valves set at 220 psi…these go off anywhere from 180 psi to 300 psi….it can be very loud and very startling when the pressure relief goes off! The pressure on delivery is unpredictable….from 50 psi to already venting. Use the highest pressure tanks first. Always look at the pressure gauge before moving a cylinder…the act of moving the tank can set it off if the pressure is too high. Make sure the relief valve is not pointed at you or anyone else when moving a questionable cylinder. Vent manually if necessary before moving the cylinder…drop the pressure to about 200 psi. When you install a cylinder on the manifold, completely open the pressure building

valve when the pressure drops below ~ 150 psi. If the pressure maintains itself at 200 psi or thereabouts, no need to open the valve. Sometimes the cylinders will not build pressure even with the building valve wide open. As long as there is plenty of liquid in the cylinder and the pressure is maintained with at least 60-70 psi, this will be okay…there is nothing you can do to make the cylinder build pressure, short of having a picnic in the closet and using the heat gun to warm it up. If it will not maintain even a reasonable pressure, report it to Tom as inoperable and request a free replacement tank. On occasion, the vent valve will be left partially open when delivered…check them when they are delivered. Sometimes the pressure relief valve gets frozen open….melt the ice with warm water…if this doesn't work, ***lightly*** tap in the valve with a wrench. If the situation becomes dire and you have a reasonable expectation of running out of nitrogen, inform the group members by email and request conservation if possible, and no use of the glovebox until resupply arrives. As needed, manually switch the manifold to the other bank to use gas from the higher pressure side (the lights on the manifold don't work…don't pay any attention to them). Until you get the hang of this system, check the closet frequently (read every day!), then check it every day anyway. Finally, if you do run out of nitrogen and you are roundly criticized by your fellow group members, politely ask if they would like to trade jobs…you have just been granted the most time-consuming and unpredictable job in the lab. Congrats!

Liquid supply:

Maintain a tank for liquid use, stored by the fridge in the 3rd floor lab. A tank usually lasts 8-10 days here, but again, this may vary considerably. Check the tank regularly, and ask all group members to inform you if they discover the tank is empty. If you leave a wrench or the large channel lock pliers by the tank, the driver will connect the transfer line for you on a new cylinder. No manipulation of these cylinders is required.

Compressed Gas Order Form

If you do not have a stockroom ID please fill out a New User Form prior to filling out this form.

***NOTE* -->Orders must be placed by *2:30 pm* for next weekday delivery. Thank You. <--**

Stockroom User ID: jlb Email Address: jbahr@rice.edu

Type of Gas: liquid nitrogen Size: NI 160 L

Fund Code: xxxxx Org Code: 416000

Date cylinder is needed: Tuesday, 28 August Your phone number: 6249

Comments: one cylinder for liquid use please

If you want this cylinder to be delivered to a building OTHER THAN the Space Science Loading Dock please complete the following:

Building Name: DBH Room #: 300

If no one is in the lab when delivery is attempted, cylinders will be left outside the lab.

Select Submit to submit the request.
Select Reset

Comments should be sent to chst@ruf.rice.edu
Go back to the Stockroom Home Page.

Compressed Gas Order Form

If you do not have a stockroom ID please fill out a New User Form prior to filling out this form.

***NOTE* -->Orders must be placed by *2:30 pm* for next weekday delivery. Thank You. <--**

Stockroom User ID: jlb Email Address: jbahr@rice.edu

Type of Gas: liquid nitrogen Size: PG 45

Fund Code: xxxxx Org Code: 416000

Date cylinder is needed: Tuesday, 28 August Your phone number: 6249

Comments: four cylinders for gas use please

If you want this cylinder to be delivered to a building OTHER THAN the Space Science Loading Dock please complete the following:

Building Name: DBH hall closet Room #: 260

If no one is in the lab when delivery is attempted, cylinders will be left outside the lab.

Select Submit to submit the request.
Select Reset

Comments should be sent to chst@ruf.rice.edu
Go back to the Stockroom Home Page.