

NMR Hardware

Things the Manual Doesn't Tell You....

Samplechangers

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Samplecase Moving

Moving the spectrometer caused the samplecase to fail...

- Sample transport tube requirements changed after move



Heated/Cooled Samplechangers

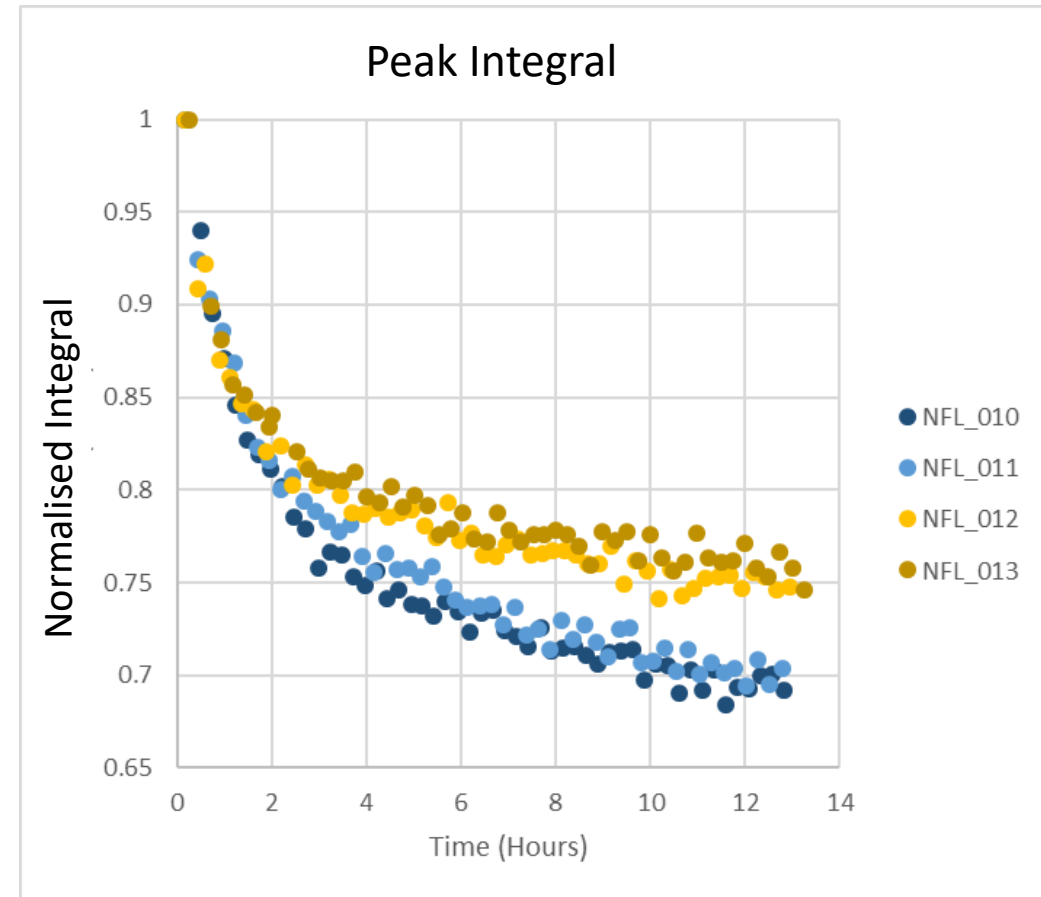
Hold samples at a specified temperature outside the magnet

Practicalities:

- Need to ensure adequate air supply
- Condensation?

Simultaneous Time courses

- Spectrometer repeatedly swaps between samples
- Relies on temperature controlled sample changer
- Does hurt time resolution



Samplejet

Extremely High Capacity (Just shy of 600 samples)

Quickly swap blocks of 96 samples at a time

Practicalities:

- Non reusable caps costing ~50p a pop
- 480 of those positions need special short NMR tubes



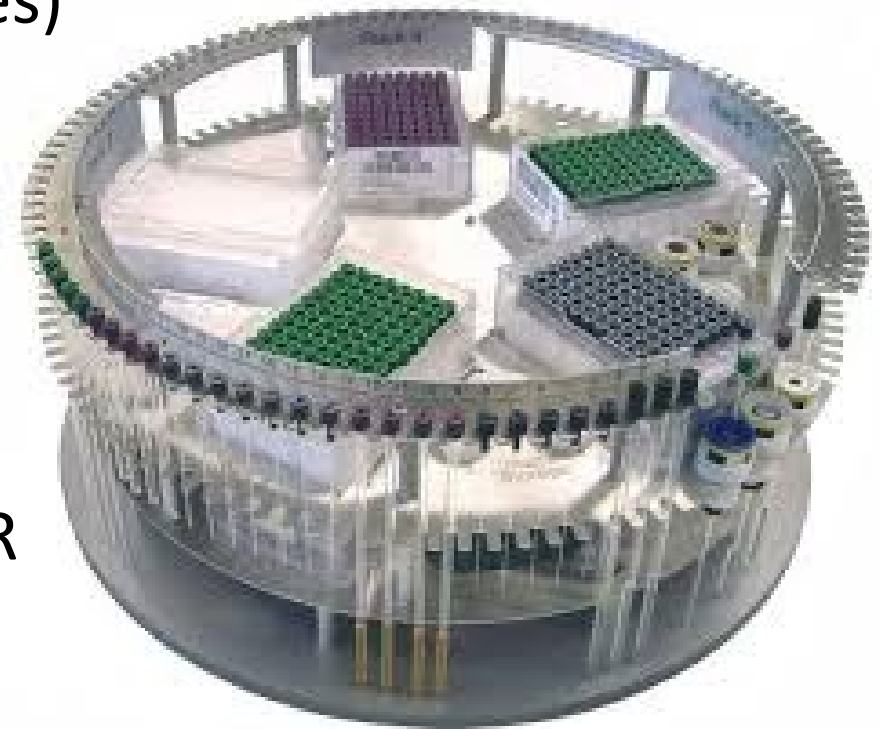
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Cryogen Recovery

Things the Manual Doesn't Tell You....

Helium Recovery

Practicalities:

- Reliquefy/sell back to supplier
- Space concerns
- Frustrating He Fills



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Magnets – He Reliquefying

Never do a Fill again!

Practicalities:

- Hold time during power outage/failure
- Emergency He Fills...
- Electricity bills

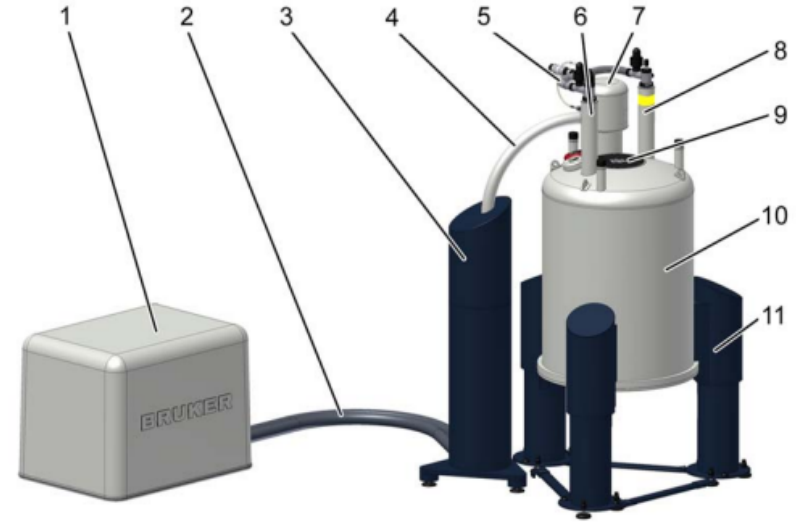


Magnets – N2 Reliquefying

Never do an N2 Fill again!

Practicalities:

- Boil off like a “normal” magnet in case of failure
- Occasional N2 Fills become more complicated
- Very expensive (unless you have an He cryoprobe)



- 1 Cryogenic Refrigerator Compressor
- 2 Cryogenic Refrigerator Flex Lines
- 3 Rotary Valve (RV) covered by the Rotary Valve Column (RVC)
- 4 Connecting Line
- 5 Helium Flow System
- 6 Current lead turret
- 7 Cryogenic Refrigerator Cold Head
- 8 Helium fill-in turret with helium fill-in port
- 9 Room Temperature bore
- 10 Room Temperature vessel
- 11 Magnet Stand

Cryoprobes

Things the Manual Doesn't Tell You....

Helium Cryoprobes

3-5x Boost in SNR over room temp probes

Practicalities:

- Major site planning considerations
- Expensive



Nitrogen Cryoprobes

2-3x Boost in SNR over room temperature probes

(Comparatively!) budget friendly

Easier siting

Practicalities:

- Found an extremely long warmup/cooldown cycle is needed
- “Open” systems need regular N₂ fills
- “Closed” systems need chillers

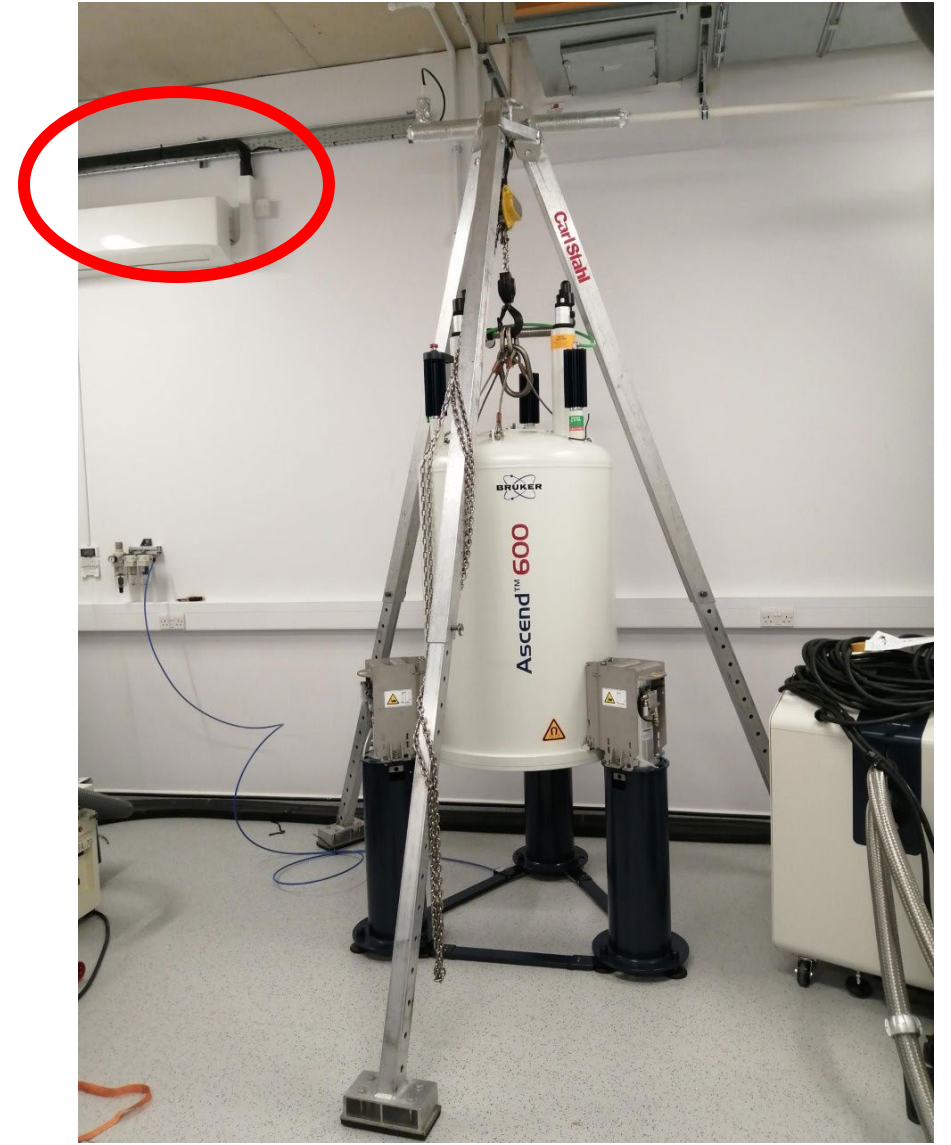


Air Handling

Things the Manual Doesn't Tell You....

Air Conditioners

- Matched to spectrometer output
- Correct refrigerant
- Servicing requirements



Air Compressors

- Oil Free – Important in case of failure
- Lifetime cost and reliability – scroll vs piston?
- Monitors to check humidity etc?



Benchtops

Things the Manual Doesn't Tell You....

Benchtops

- Many don't/can't run at 25 degrees
- Degree of flexibility for pulse programming varies





Synchrotron

NMR

Any questions or discussion?