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Thermal Outgassing from OFS-Cu Tubes following different cleaning methods

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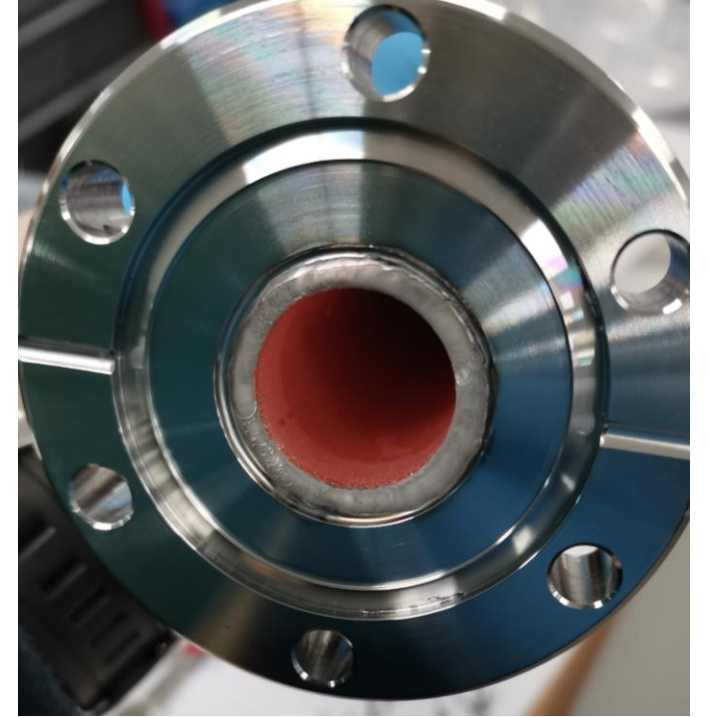
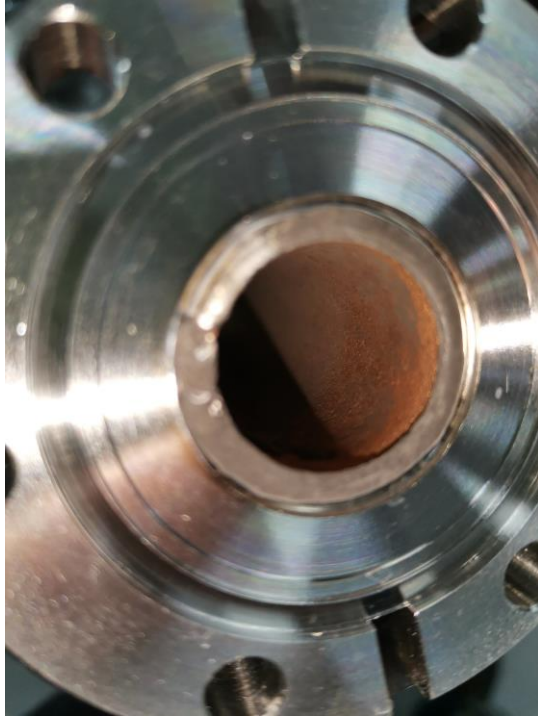
05/04/2022

The 3 tubes

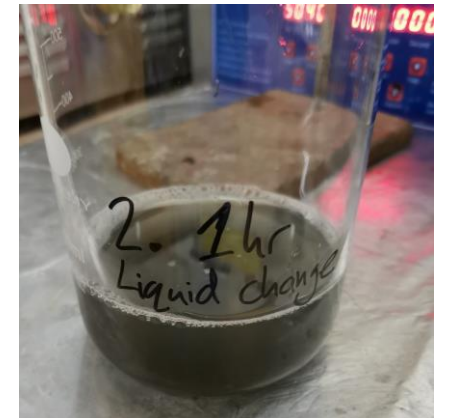
Cleaned at DESY and DL

1. Elma Clean + $(\text{NH}_4)_2\text{S}_2\text{O}_8$ (TK Ag 50-08)
2. Elma Clean + BPS (TK Ag 50-15)
 - 20 minute clean with BPS-172 Solution (10:1 mixtures)
3. Elma Clean + $(\text{NH}_4)_2\text{S}_2\text{O}_8$ + BPS (TBD)

Black coating on TK Ag 50-08

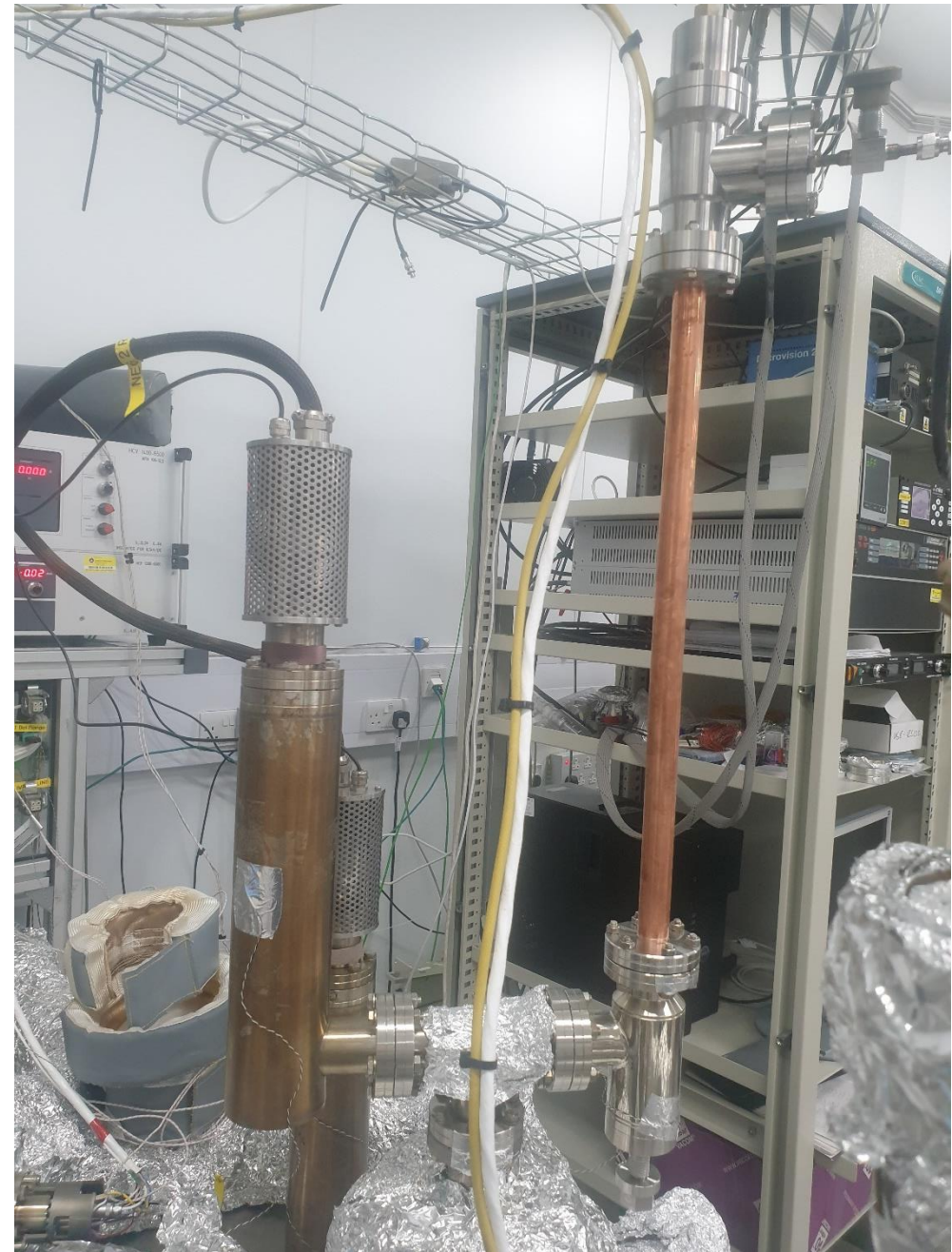


- Cleaned with BPS-172 (1-10 ratio):
 - 4*30min cycles
 - Fresh solution used for each cycle



Set-up

- Two RGAs, separated by a blank gasket with a 2.5mm hole drilled into the centre.
- A valve is covered with a blank, and the system itself baked at 200°C for 24 hrs.
- The copper tube is installed, with a valve on each end, and pumped with a scroll from the top.

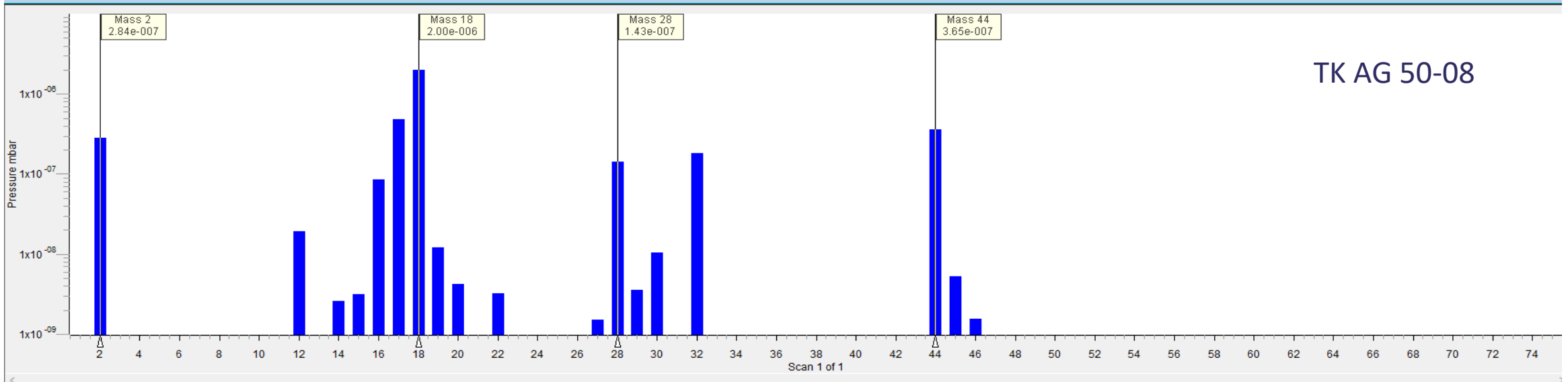
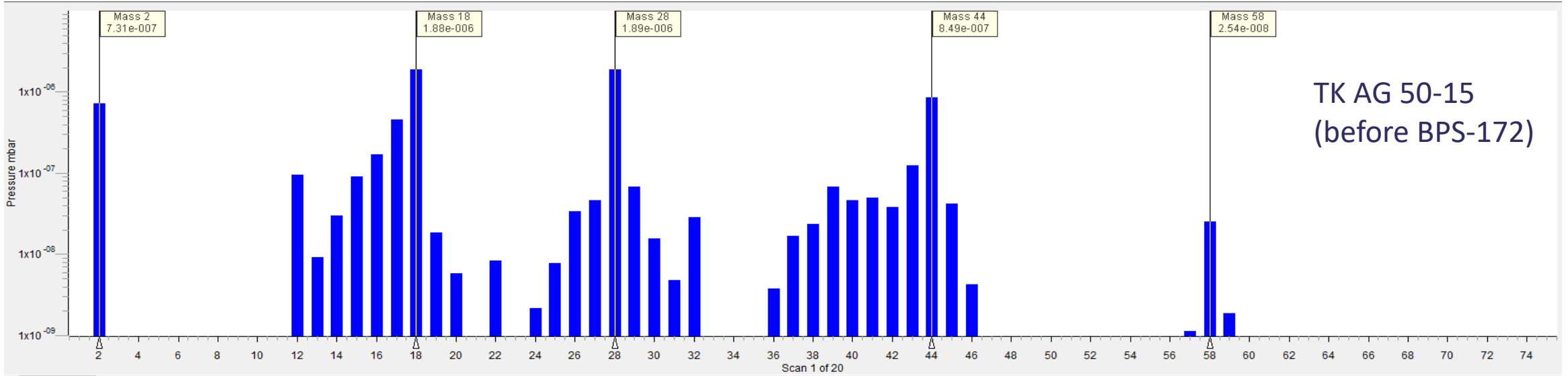


Desorption

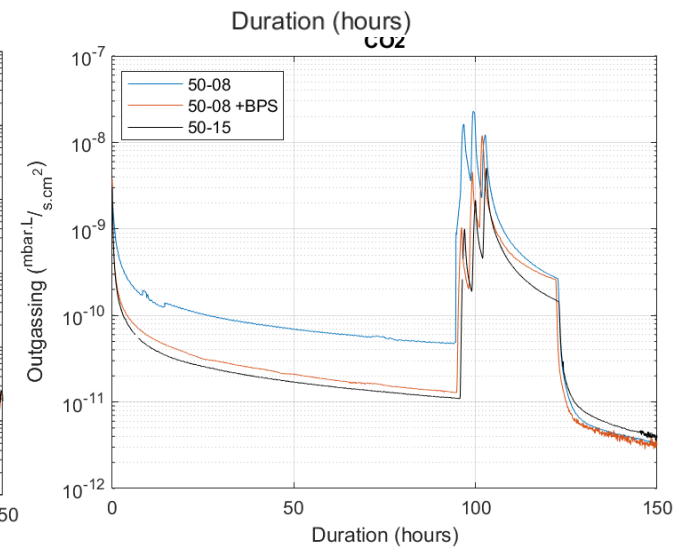
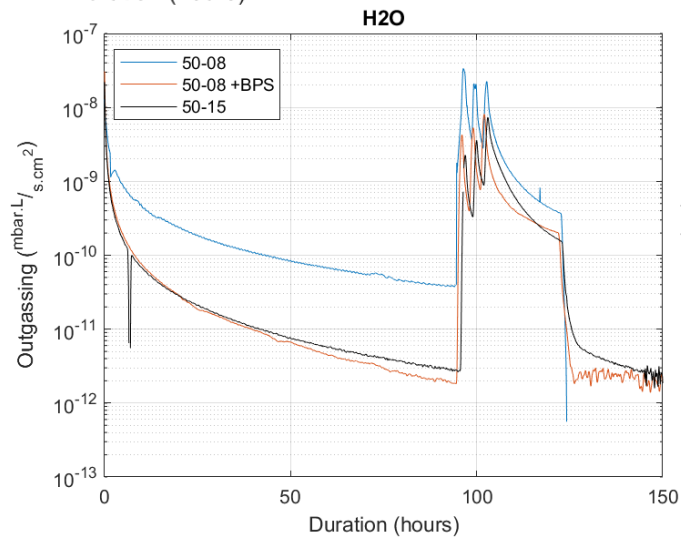
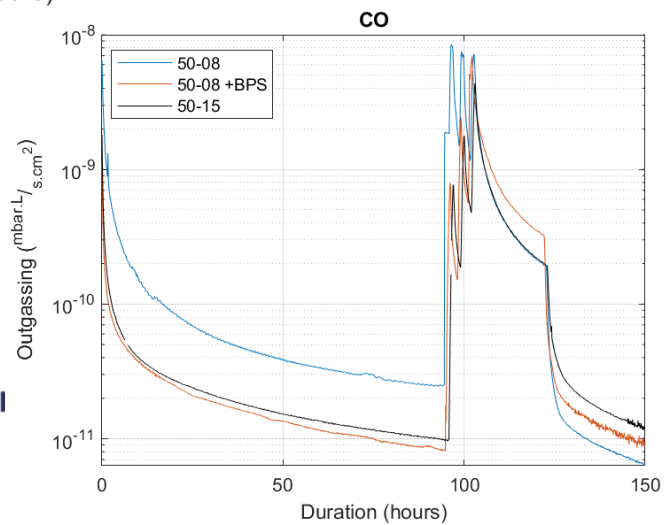
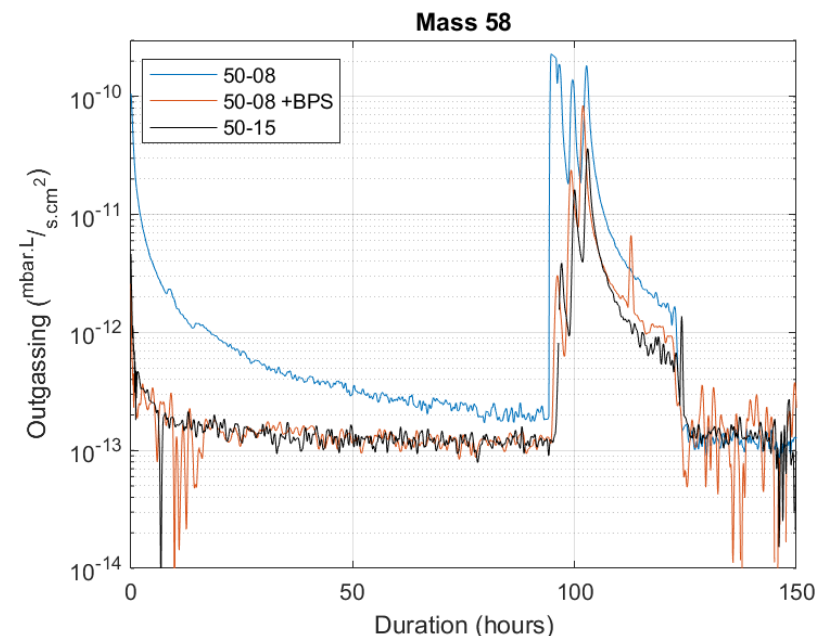
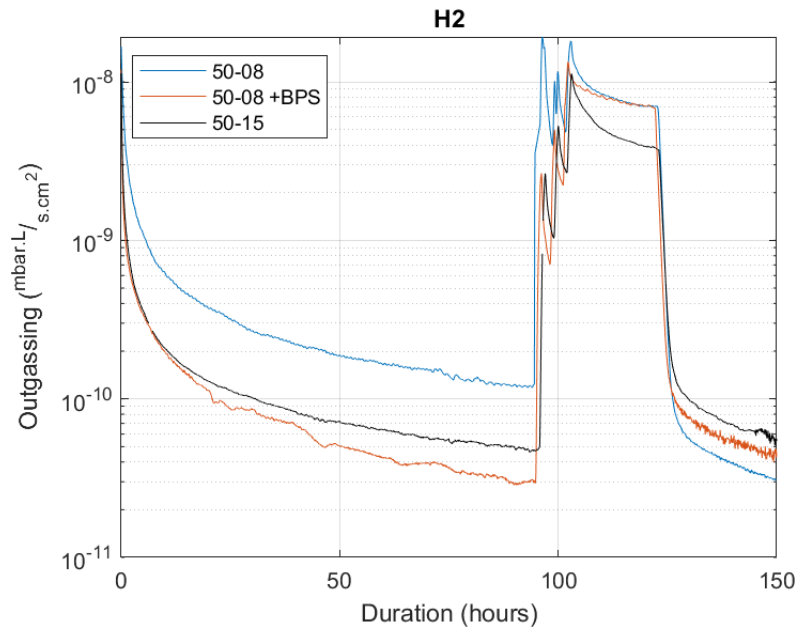
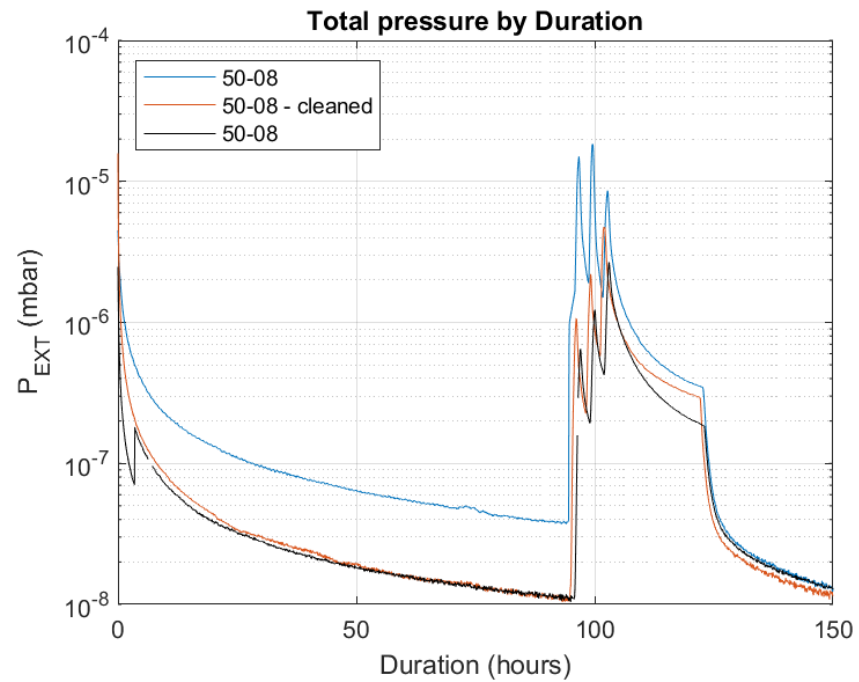
- Pumped for 4 days at RT
- The tube was then heated:
 - Increase to 100°C and hold for 2 hrs
 - Increase to 150°C and hold for 2hrs
 - Increase to 200°C and hold for 20 hrs
 - Return to RT
 - All Temperature changes done at a rate of 50°C/hr

- This is repeated with each tube

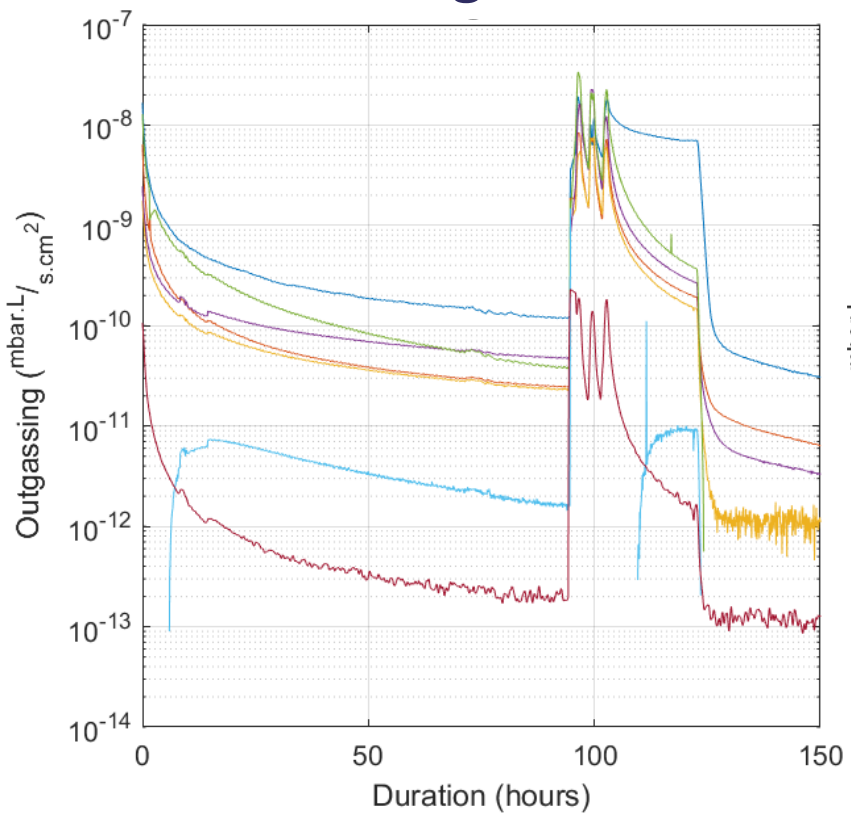
Thermal Outgassing Comparison



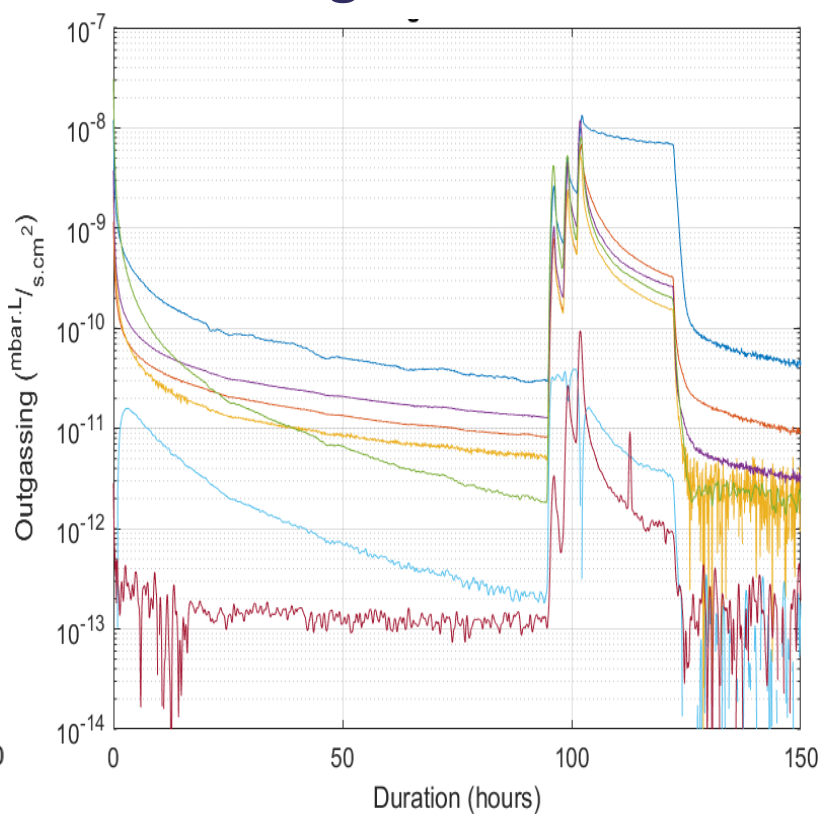
Thermal Outgassing Comparison



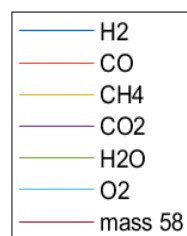
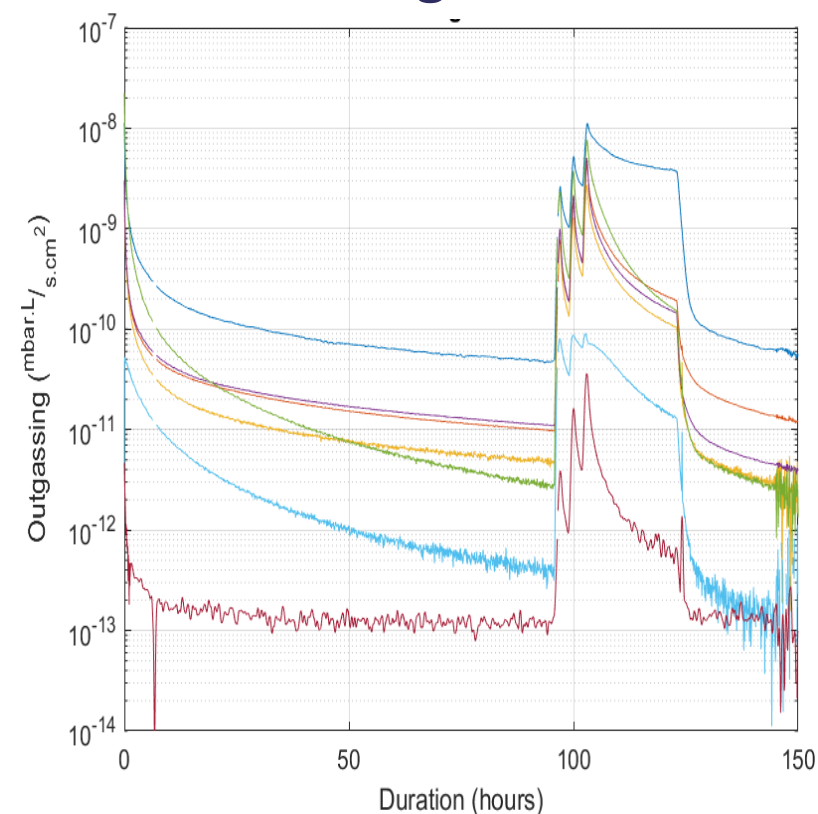
TK Ag 50-08



TK Ag 50-08 + BPS



TK Ag 50-15



ESD

- Still working out the set-up
- Need consistent measurements between the tubes

Summary

- Two tubes have had thermal outgassing measurements taken.
 - No serious differences between them
 - Black-coating gives the greatest outgassing, but greatest improvement after baking
- What Next?
 - Check to see if all other tubes have the same black coating
 - Test another black tube for comparison?
 - Clean a black tube without a bake-out first and test this?



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Thank you

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