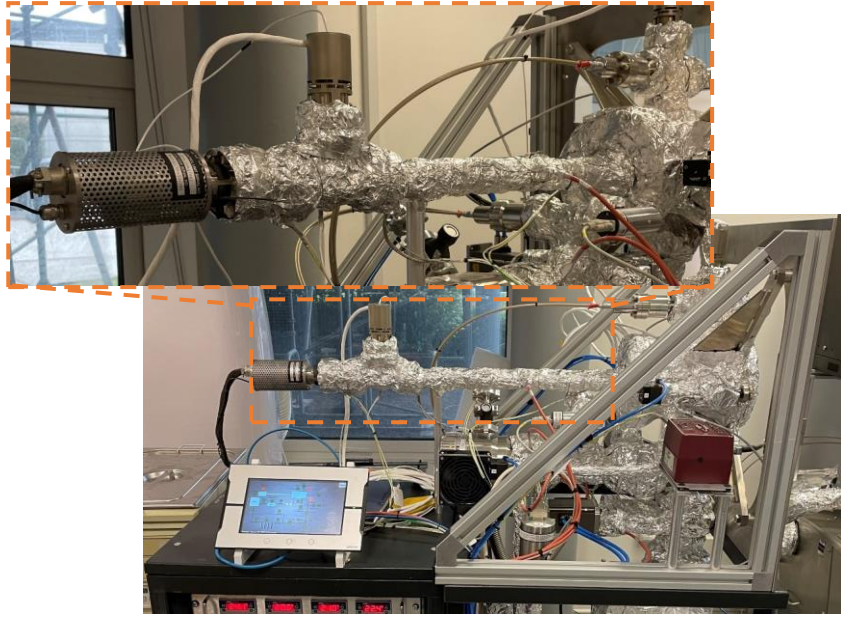
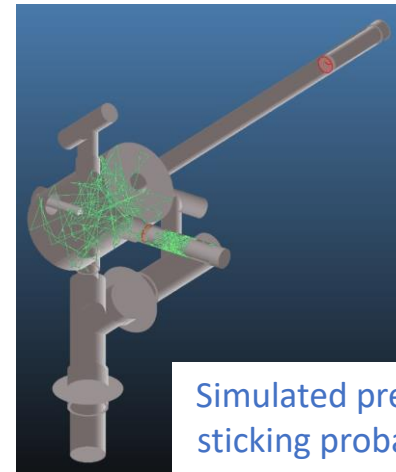
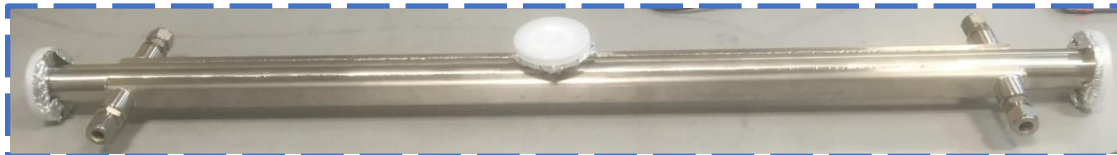


Diamond Light Source - NEG & PSD update

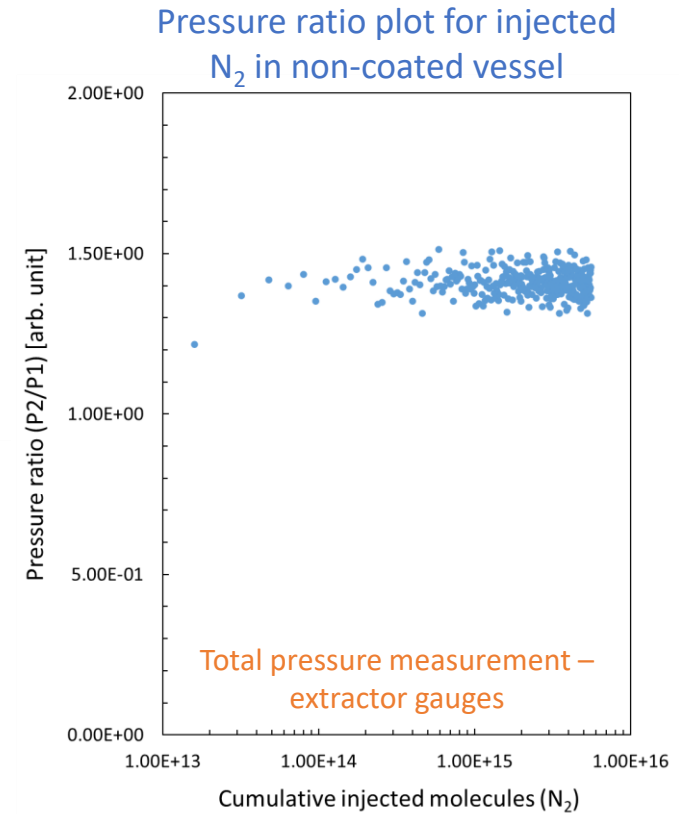
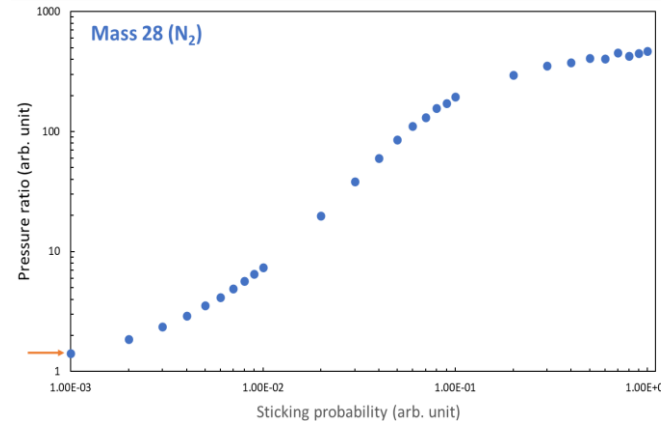


- Coating rig operational with ternary (TiZrV) twisted wire
- Pumping speed measurement rig (left) in use and operating
- Testing completed on simple, non-NEG coated, DN40 vessel (below right), $\alpha < 0.001$ for N_2

- **Next steps:** pumping speed measurements on PSD vessel removed from test beamline (coated by I.FAST partner, see below)
- Sticking factors used in PSD data analysis



Simulated pressure ratio-sticking probability curve



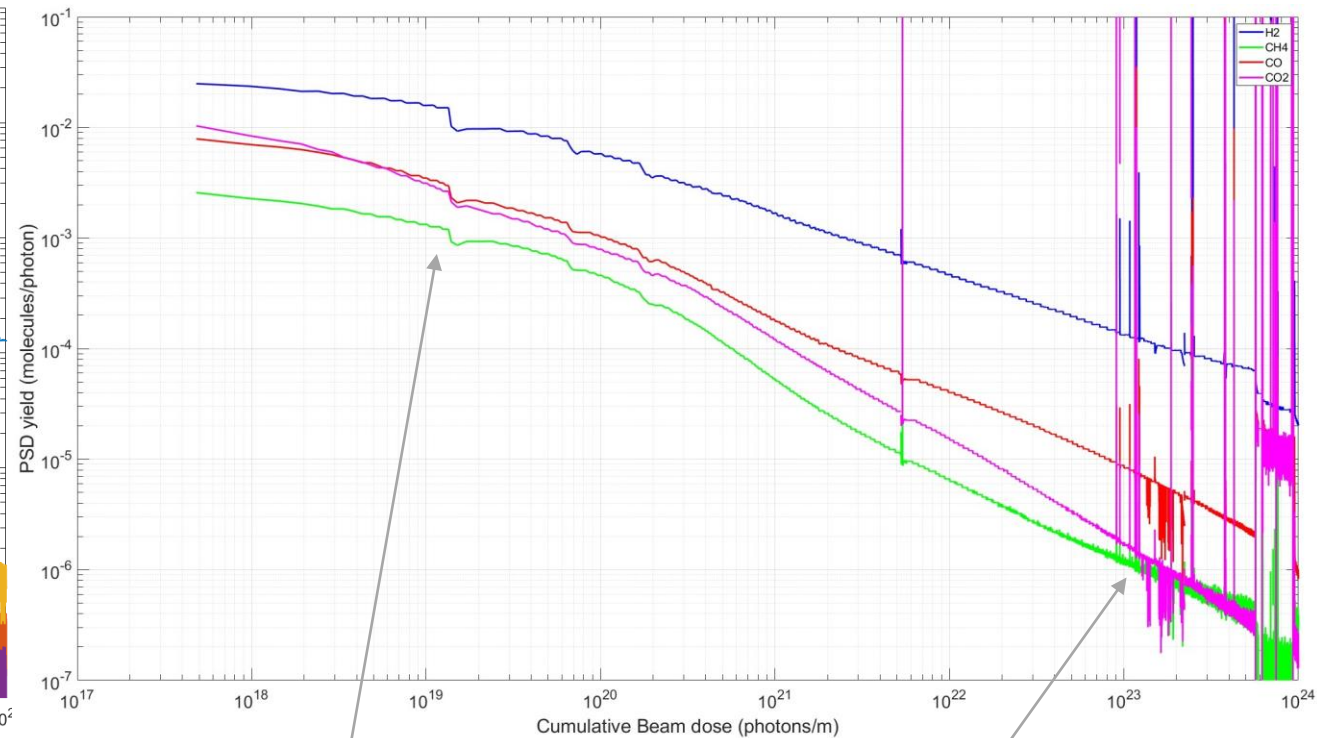
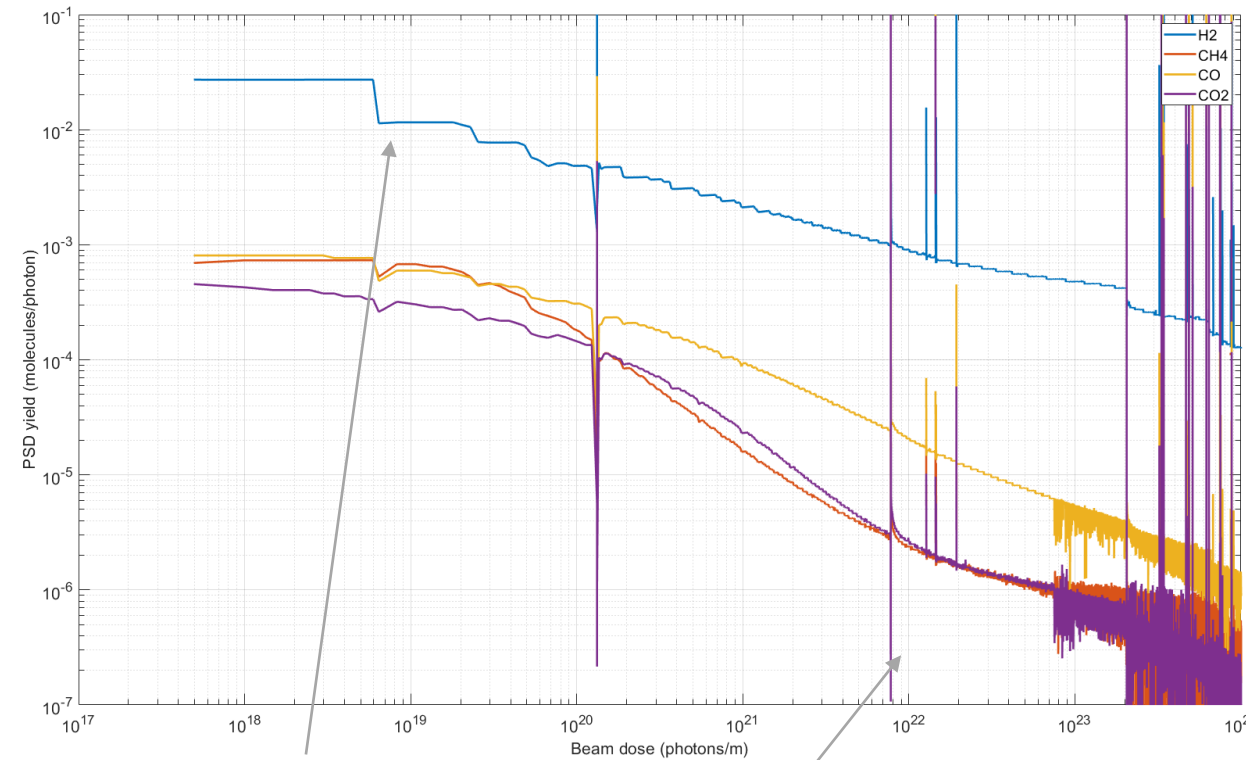
Diamond Light Source - NEG & PSD update

Photon-stimulated desorption data collected from:

a) uncoated stainless-steel vessel - shown below left

b) TiZrV coated stainless-steel vessel - shown below right

Vessels are $\varnothing 34.9$ mm and 1000 mm long



Preliminary non-coated PSD data

- Deviations from beam current changes or transient events (e.g. valve moves)
- Step changes due to partial background correction – analysis to be refined

Preliminary NEG-coated PSD data

- Large excursion in CO/CO₂ PSD yield likely due to sticking probability variation – offline lab measurements to confirm values
- Deviations again due to beam current changes or transient vacuum events

Diamond Light Source - NEG & PSD update

Current status:

March 2024 – installed new $\varnothing 20\text{mm}$ Cu-vessel (I.FAST-type), coated at Daresbury Laboratories with TiZrV NEG layer

Next steps:

#1

- End-station and vessel bake but **no activation** of NEG layer
- Short PSD yield measurement

#2

- **Activation** of NEG coating
- In-situ pumping speed measurements
- Extended PSD yield measurements

