

# IonTamer™ PS long-term stability

CONFIDENTIAL

2023-01-24 | Sébastien Gasc

# Long-term stability

## Measurement description

### IonTamer PS-H operation

- Continuously ON
- High Emission (2 mA, 70 eV)

### Long-term test conditions

- Continuous Cl<sub>2</sub> inlet @  $1.7 \cdot 10^{-7}$  mbar (=  $1.257 \cdot 10^{-7}$  Torr)
- Total test duration: 440 h of cumulated operation with Cl<sub>2</sub> inlet

### Reference measurements

- Conducted every 2-3 days, right before closing the Cl<sub>2</sub> inlet or right after opening the Cl<sub>2</sub> inlet
- Gas inlet @  $1.7 \cdot 10^{-7}$  mbar (=  $1.257 \cdot 10^{-7}$  Torr): mixture of Cl<sub>2</sub> & noble gas mixture (1 ‰ krypton, rest. argon) in 5:1 proportion
- 15-minute integration time

### Data analysis considerations

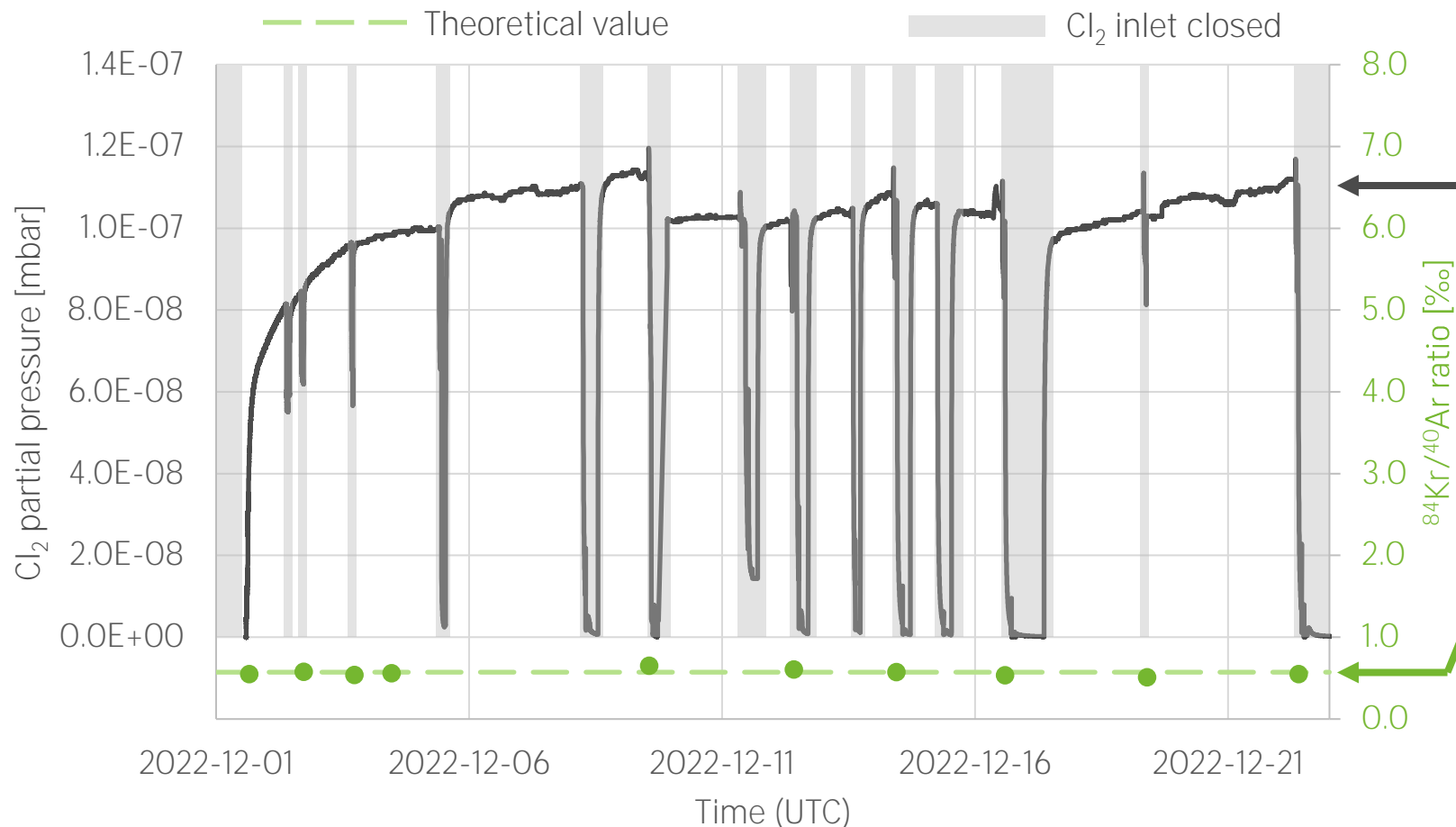
- Data have been corrected for the specific sensitivity of the IonTamer to chlorine, argon, and krypton
- Theoretical value of 1 ‰ Kr in Ar has been corrected (to 0.572 ‰) to take into account isotopic ratios for <sup>40</sup>Ar and <sup>84</sup>Kr

### Results

Time (UTC)	<sup>84</sup> Kr/ <sup>40</sup> Ar ratio [‰]
2022-12-01 15:42	0.549
2022-12-02 17:26	0.579
2022-12-03 17:33	0.538
2022-12-04 11:14	0.559
2022-12-09 13:26	0.652
2022-12-12 09:58	0.606
2022-12-14 10:39	0.573
2022-12-16 14:06	0.536
2022-12-19 09:33	0.509
2022-12-22 09:26	0.551

# Long-term Cl<sub>2</sub> measurement

Variation of the <sup>84</sup>Kr/<sup>40</sup>Ar ratio over time during long-term Cl<sub>2</sub> measurements



The IonTamer™ reliably measured the partial pressure of Cl<sub>2</sub> over more than 440 h of cumulated operation. Variations in the signal are due to variations in the process chamber the IonTamer™ was connected to.

While measuring in a harsh environment with corrosive gas (Cl<sub>2</sub>), the instrument remained quantitative and was capable to measure a stable and correct Kr/Ar ratio.

Reference measurements were conducted right before closing the Cl<sub>2</sub> inlet or right after opening the Cl<sub>2</sub> inlet.