SnT 2025 CTBT: SCIENCE AND TECHNOLOGY CONFERENCE
8 SEPTEMBER ONLINE DAY
9 TO 12 SEPTEMBER AT HOFBURG PALACE, VIENNA & ONLINE

Research on Intelligent Sampling Process for Atmospheric Radioactive Xenon Based on Online Mass Spectrometry

LIGHTNING TALK

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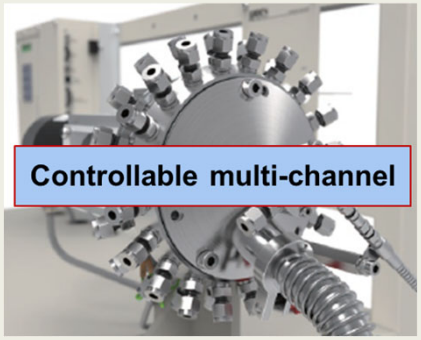
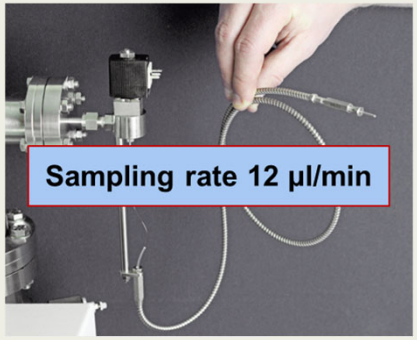
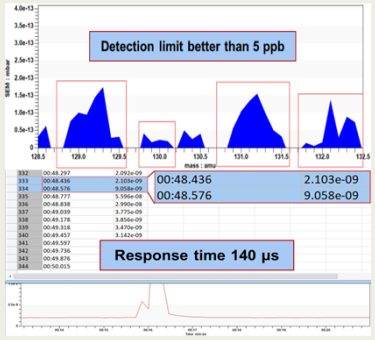
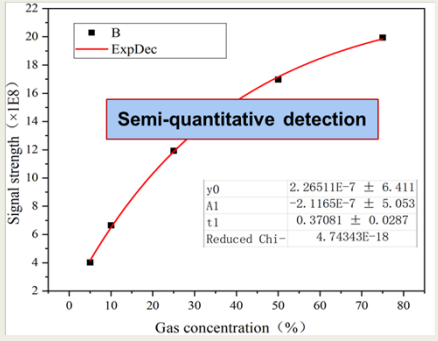
T3.2-889

- In response to the demand for high-sensitivity monitoring atmospheric radioactive xenon isotopes, this study investigates an intelligent dynamic sampling method based on online mass spectrometry technology. Traditional atmospheric xenon sampling processes rely on time-fixed control modes and stable xenon measurement techniques using thermal conductivity detectors, which suffer from issues such as process response lag and fluctuations in sample purity.
- This research integrates an online mass spectrometer with a micro gas sampling device, achieving a comprehensive online monitoring system capable of semi-quantitative real-time detection from ppb-level atmospheric concentrations to high-purity xenon. The core of the intelligent sampling technology lies in establishing a collaborative control system between the online mass spectrometer and a programmable logic controller (PLC).
- By using the xenon concentration signals fed back from the online mass spectrometer, the PLC can dynamically adjust the adsorption and desorption parameters, replacing the traditional fixed-timing control logic and enabling real-time optimization of process parameters.

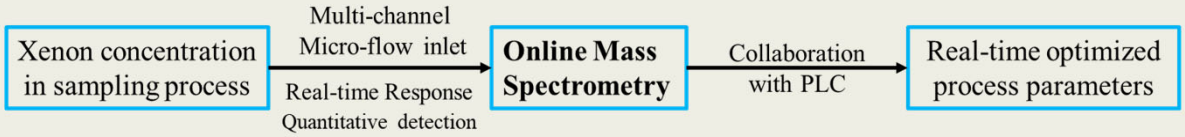








- The application of this intelligent dynamic sampling technology is expected to significantly enhance the accuracy and timeliness of atmospheric radioactive xenon monitoring, providing a solid technical foundation for the intelligent and adaptive development of atmospheric radioactive xenon sampling.



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