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A new process design for compact radioxenon separation system

In the context of the Comprehensive Nuclear Test Ban Treaty, the CEA developed the SPALAX system about 15 years ago. It is currently implemented in the International Monitoring System to detect and characterize xenon releases following a nuclear explosion. This system is still under continuous improvement; in order to reduce the footprint and the energy consumption, the separation and purification steps can be optimized further. The internally developed Ag@ZSM-5 zeolite adsorbent can be an ideal candidate given its site of strong interaction with xenon at low partial pressures. This zeolite has unmatched capacity at partial pressures of xenon in air. This material is now tested with a new and more compact design of the process. This system can separate directly xenon from air without any nitrogen membranes, and thus with a limited working pressure and energy requirement. System and its performances will be illustrated.

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