

Developments of Molten Salt Reactor Technology and its Possible Impact on Global Radioxenon Emission

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Radioxenon is a gaseous fission product produced during nuclear weapons testing. Besides nuclear testing, the biggest radioxenon emission comes from medical isotope production facilities, which emit 109 -1013 Bq/day, while the power plant emits 109 Bq/reactor/day. However, the recent development of generation-IV reactors showed that a potential radioxenon release from a single molten salt reactor (MSR) could be higher than that from a conventional nuclear power plant (NPP) and could reach approximately Xe-133 1010 Bq/day. The aim of this work was to provide an update on the MSRs' development in the world and to estimate the likelihood of an increase in overall radioxenon emissions. A literature review showed that MSRs could be used for two main purposes: electricity production and minor actinide transmutation. China (TMSR), Canada (IMSR400, SSR-W), the United States (KP-FHR, Mk1 PB-FHR, LFTR, and Thorcon), the United Kingdom (SSR-U), Denmark (CMSR), and Indonesia (Thorcon) are all working on MSRs for electricity generation with capacities ranging from 40 MW (t) to 600 MW (t), while the Russian Federation plans to use MSR to utilize minor actinide. According to research, the first increase in global radioxenon emissions due to the MSR's operation could be expected in 2028.

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Promotional text

To support the sustainability of radionuclide detection on IMS, we are excited to share our purposive research to provide an update on the MSRs' development and its possible impact on overall radioxenon emissions.

Oral preference format

in-person

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