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Research Gaps and Strategic Opportunities in High Integrity Container Technology for Radioactive Resin Waste in Developing Countries

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Abstract: High integrity container (HIC) has become a sustainable solution for radioactive spent ion exchange resins (IERs) conditioning due to its stability for long-term storage and disposal and has been implemented in Wolseong Korean nuclear power plant (NPP) and some China's NPPs. Despite the absence of NPP in Indonesia, radioactive IERs in Indonesia has been generated from nuclear research reactors, pool storage for spent fuels, and liquid radioactive waste treatment, emphasizing the need for sustainable conditioning particularly in using HIC. This study examines global research trends in High Integrity Container (HIC) technology for conditioning spent radioactive ion exchange resins (IERs). Using bibliometric analysis of publications and patents (1960-2024), we identify key developments and gaps in the field. The results highlight significant disparities in research contributions, with developed nations leading innovation while developing countries remain underrepresented. Our findings provide guidance for future research priorities, particularly in adapting HIC technology for non-power reactor applications. The study underscores the need for international collaboration to advance sustainable radioactive waste management solutions.

Technical Track

Fuel Cycle and Waste Management

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