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Pyrolysis and Plasma applied to Nuclear ion Exchange Resins Treatment

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Spent ion exchange resins (IER) represent an important waste stream that is generated during the operation of both light and heavy-water reactors. Over the past 60 years of nuclear activity Argentina has accumulated over 300 m³ of spent IERs that to this day remain interim storage. With a view toward achieving a significant volume reduction and improved product stability we are investigating a two-step process involving initial low-temperature (< 350 °C) pyrolysis followed by immobilization in a polymeric matrix such as Epoxy or Phenol formaldehyde and nanocomposites thereof without any significant volume increase. Also contemplated as part of the overall process is the destruction of radioactive off-gas using an induction plasma system with subsequent trapping of radioactive gases using high performance adsorbents. This talk will provide an overview of the overall process that is being investigated paying particular attention to the waste form structure and efficient off-gas treatment system.

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