

Molten Salt-Based Separation Technologies for Treating Spent Oxide Fuels

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Molten salt-based pyrometallurgical partitioning process which was developed to provide a compact, efficient method for recycling metal fuel can be extended to treat spent oxide fuels with an addition of the head-end processing steps. The pyrometallurgical process consists of an electrorefining and a reductive extraction in a LiCl-KCl eutectic system. The aim of the head-end processes is to remove the oxygen by a reduction or chlorination in a molten salt system for the purpose of preparing spent oxide fuels suitable for the electrorefining step. Pyrochemical process from the head-end process using a molten salt to the pyrometallurgical process, when the two processes are well combined, is a promising option for a back-end fuel cycle and it is under investigation in many countries. By focusing on the pretreatment techniques, the current technical applications of molten salt-based technologies to the back-end fuel cycle of spent oxide fuel are summarized and compared in this paper.