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Revolutionizing desalination: KISR's breakthrough projects addressing water crisis challenges

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A B S T R A C T

Desalination, a vital solution to the rapidly increasing global water crisis, faces persistent challenges in efficiency, sustainability, and economic viability. This article presents a comprehensive overview of innovative research activities of the Water Desalination Technologies (WDT) program at the Water Research Center (WRC) of the Kuwait Institute for Scientific Research (KISR) aimed at revolutionizing desalination technologies to combat these challenges. The article explores a multidimensional approach, showcasing WRC's intensive efforts in exploring innovative processes and cutting-edge technologies. This paper highlights various innovative projects conducted at laboratory and pilot scales and covers diverse solution areas. From exploring forward osmosis processes to pioneering hybrid membrane systems and zero liquid discharge treatment for oil-produced water, the WRC's initiatives cover a broad spectrum of technological advancements. Notably, the research also explores mineral extraction technologies and cutting-edge developments in membranes, showcasing a holistic approach to addressing desalination challenges. The article emphasizes KISR's commitment to innovation by spotlighting the institute's intellectual property developments in the desalination and water treatment domains. These initiatives collectively underscore a dedicated effort to overcome hurdles in desalination, offering promising pathways toward heightened efficiency, sustainability, and the realization of a water-secure future. By presenting a detailed overview of WRC's pioneering research, this article contributes valuable insights into the evolution of desalination technologies, paving the way for impactful advancements in the field.

Keywords: Desalination, Cutting edge technologies, hybrid membrane systems, zero liquid discharge, mineral.

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