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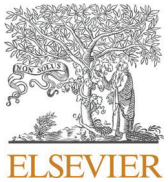

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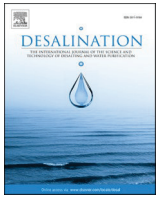

The economic value of the extracted elements from brine concentrates of Spanish desalination plants

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HIGHLIGHTS

- The value of the elements present in the desalination brine has been obtained.
- This value varies depending on the source of desalinated water.
- Two types of valuable elements are identified according to price and quantity.
- The results are key to design the brine mining strategy.

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ABSTRACT

The disposal of desalination brine, which contains a higher concentration of salts, is treated as waste and discharged into the environment. In this brine, several elements, when processing and extraction were possible, could be susceptible to exploitation and valorisation. Among all the ions existing in desalination brine, and whose industrial use is possible, sodium (Na), magnesium (Mg), calcium (Ca) and boron (B) are found at high concentrations; there are also other elements, not as abundant as previous, but highly demanded in the current industry, such as lithium (Li), rubidium (Rb), strontium (Sr) or gallium (Ga). These elements, as well as other alkaline metals, have taken on considerable prominence today due to their technological applications. Analysing the prices and quotations of these elements in the international markets for raw materials, it is possible to determine the economic potential of this mining activity of desalination plants in Spain. The economic value of the extracted elements also incorporates other additional advantages, which focus on the elimination, or reduction, of brine discharges, the savings in transportation and transaction costs of raw materials, in addition to the considerable reduction in environmental impacts caused by traditional mining.