Efficient Removal of Ca and Mg Ions From Water Using Jordanian Zeolite: A Low-Cost and Recyclable Environmental Solution

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Water hardness, caused by calcium and magnesium ions, is a global problem that can have negative effects. In this study, we investigated the use of Jordanian zeolite as a cost-effective and environmentally friendly solution for treating hard water. Water samples were treated with Jordanian zeolite for varying durations, and the results showed that the longer the duration of treatment, the more efficient the zeolite was at exchanging calcium and magnesium ions. These findings suggest that Jordanian zeolite has promise as an alternative source for treating hard water, particularly in industrial applications and borehole water with calcifications. However, the disposal of waste from the treatment process is a significant challenge. To address this issue, we developed Eco Zeo Concrete (EZC), an environmentally-friendly and cost-effective alternative to traditional concrete that uses natural zeolite and recycled HDPE fibers. The EZC process reduces greenhouse gas emissions and improves the economic viability of a country. Future work could investigate the long-term effectiveness and durability of EZC compared to traditional concrete, as well as the scalability of the project and its impact on the environment and economy. This innovative project addresses the issue of water hardness and waste management while also promoting sustainability and economic development.

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