The impact of rice husk, activated carbon, almond shell, and sand filters on some physical and chemical properties of aqueous salt solution

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ABSTRACT

In this study, the impact of rice husk, activated carbon, almond shell, and sand filters on some physical and chemical properties of saline water was investigated and compared. Salt solutions were collected downstream of columns filled with pure sand, sand plus rice husk, sand plus activated carbon, and sand plus almond shell, all with similar weights. The turbidity, water hardness, and the concentrations of chloride, sodium, potassium, magnesium, and calcium ions were measured over time. The results showed no effect of the pure sand on the adsorption of chloride (Cl\(^{-}\)), calcium (Ca\(^{+}\)), and magnesium (Mg\(^{+}\)) ions. However, the highest adsorption of Ca\(^{+}\) (30.5%), Cl\(^{-}\) (20%), and Mg\(^{+}\) (17.5%) ions and the maximum reduction of water hardness (23%) were achieved by passing saline water throughout a mixture of sand plus rice shell filters. The minimum adsorption of the ions was obtained with a mixture of sand plus almond shell filters. None of the filters had a significant impact on electrical conductivity of the saline water. In conclusion, combining sand filter with rice and almond shell filters were more effective in the desalinization of saline water.

Keywords: Activated carbon; Almond shell; Time impact; Rice husk; Sand

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