Web link

Title:

The performance of pumice as a filter bed material under rapid filtration conditions

Burhanettin Farizoglu, et.al., Filtration & Separation, Volume40, Issue 3, Pages 41-47, April 2003

Abstract:

Deep bed sand filters are used extensively in drinking water and wastewater treatment. In this study, sand and pumice were used as a filtration media under rapid filtration conditions and performance results for both were compared. Turbidity removal performance and head losses were investigated as functions of filtration rate, bed depth and particle size. Under the same experimental conditions such as 750 mm bed depth, 7.64m^3/m^2.h flow rate and, 0.5−1.0 mm grain size, turbidity removal rates for sand and pumice were found to be 85–90% and 98–99%, respectively. Furthermore, the head loss for sand and pumice were found to be 460 mm and 215 mm, respectively. The results obtained have shown that pumice has a high potential for use as a filter bed material.

Conclusions:

- For a pumice bed, smaller head loss and greater turbidity removal efficiency was observed in comparison to a sand filter bed under the same experimental conditions.
- A pumice bed has a greater porosity; so it has a greater capacity for the accumulation of particulate matter. As smaller particulate matter is deposited inside the pors of the pumice grains, the filtration bed can be used more efficiently.
- A pumice bed has a greater porosity and higher deposition capacity of particulate compared to sand bed, so pumice bed filters have longer periods between back washers.

- Pumice is resistant to acid and basic solution. No deformation because of the water was observed during the study
- Pumice is a fragile material and it may crumble during the filtration compared to sand, but no deformation was observed during the investigation.