

Physicochemical characterization of Taita rock for flocculation properties in water treatment

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Abstract

Suspended particles in drinking water can be detrimental to human health leading such complications as appendicitis. Treatment solution that flocculates these particles will help in minimizing these risks. Attempts used in chemical technologies have reported cases of side effects. This project sought to investigate by characterizing Taita rock for flocculative properties for use in homesteads. Taita rock is a brown natural sedimentary rock found in the coastal regions of Kenya. Characterization aimed at determining its chemical composition confirmed the rock as a reliable flocculant of suspended particles in water. Xray florescence technique showed abundant presence of Al_2O_3 (23%), SO_3 (70.2%) and Fe_2O_3 (5.67%) which by inference confirmed presence of aluminium sulphate and iron sulphate. These are known for their use in water treatment. Fourier Transform Infrared Spectroscopy (FTIR) spectra affirmed these findings as it compared well with renowned Aluminium sulphate in pugu Kaolin. Transmittance at at 870.71cm^{-1} , 1031.36cm^{-1} , 1156.61cm^{-1} was observed for SO_4 , 569.7cm^{-1} corresponded to Al_2O_3 . These two characterization findings, and in comparison, with existing data from known flocculants, indicate reliability of the rock as a natural flocculant without negative chemical effects.

Key words: particles, flocculation, natural, water