

Arsenic removal from aquatic environment using volcanic products

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Z-To 5 scoria from Zao volcano and Adachi-medeshima pumice from Adachi volcano are tested their abilities for the arsenic removal from aquatic solution. Adsorption experiments have been conducted to study the efficiency of removal of arsenic using the scoria and the pumice as adsorbents. In this study, the effect of pH, adsorbent dose, reaction time and initial arsenic concentration was investigated and adsorption isotherms and kinetic models were examined. The pumice is not suitable for arsenic removal in the conditions. In contrast to the pumice, the scoria has significant capability of arsenic removal. At pH 11, the scoria could effectively remove arsenic from solutions. Equilibrium time for arsenic removal was about 12 hours. The reaction for adsorption of arsenic could be expressed as the pseudo-second order model. Isotherm study showed that the adsorption of arsenic on the scoria fitted Langmuir isotherm better than Freundlich isotherm. Experimental arsenic adsorption capacity on the scoria was 0.35 mgAs/g. The value is well compared with some other adsorbent materials in literature. Hence, the scoria can be considered to be viable adsorbent for the removal of arsenic from aqueous environments.