

〈論文〉

生活環境水系中に存在する大腸菌ファージの定量

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概 要

社会生活の変化、水の高度・高密度な利用の拡大に伴い、身近な生活環境水系における微生物学的な安全性に新しい視点を導入する必要が出てきている。

本研究は、新しい指標としての大腸菌ファージの有効性を検討するために、その定量手法と固形物に吸着しているファージの誘出方法を生活環境水系中の各種試料に適用し、野性のファージの存在状態を調べたものである。大腸菌ファージの定量には、E. coli K12を宿主菌とし、二層寒天法を用いた。調査の結果、水路底質、下水中の浮遊物資あるいは活性汚泥など固形物に吸着した状態で多くの大腸菌ファージが存在していること、ならびに、その吸着している大腸菌ファージのほとんどがRNA大腸菌ファージであることが明らかとなった。

Phosphates Removal by Kanuma Pumice

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Abstract

Kanuma pumice, which is a kind of volcano ashes and is mainly composed of allophane, was used as a adsorbent for phosphates. The adsorption capacities of ortho-, pyro-, and tripoly-phosphate were influenced strongly by pH. The highest removals for the phosphates were found at pH 4-6, and phosphates were not removed in high pH region. The results of the fractional extraction of adsorbed ortho-phosphate suggested that 83.1% of the adsorbed phosphate was Al-P and 12.8% of that was Fe-P.

From the examination of the adsorption rate, the effective intraparticle diffusivity was obtained to be $1.30 \times 10^{-9} \text{cm}^2/\text{s}$. The columns packed with Kanuma pumice removed effectively both phosphates and organic matters from secondary effluent, and these adsorbed matters were desorbed by NaOH solution. Moreover, the alkaline effluent given from the column regeneration was also regenerated effectively by $\text{Ca}(\text{OH})_2$. Thus, the outline of a phosphate recovery system using kamnuma pumice adsorption was established as a whole.

Key Words : Phosphates removal, Kanuma pumice, Adsorption, Desorption, pH effects