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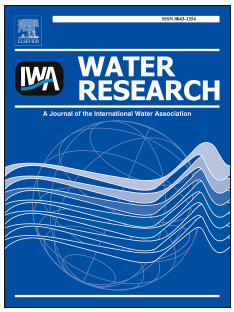

Acidification and recovery of phosphorus from digested and non-digested sludge

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Acidification and recovery of phosphorus from digested and non-digested sludge

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Abstract

Acidification was used to dissolve phosphorus from digested and non-digested sludge from five wastewater treatment plants in order to make phosphorus accessible for subsequent recovery. More phosphorus was dissolved from digested sludge (up to 80%), with respect to non-digested sludge (~25%) and the highest recovery was observed at pH 2. The acid consumption for digested sludge was higher than for non-digested sludge due to the presence of the bicarbonate buffer system, thus CO_2 stripping increased the acid consumption. In all the experiments, the sludge was exposed to acid for 1h. For the five tested sludge types, 60-100 mmol o-P was released per added mol H_2SO_4. It was mainly iron and calcium compounds that accounts for the phosphorus release at low pH. The release of heavy metals was in general low (<30%) for all the wastewater treatment plant, as Zn, Cd and Ni showed the most critical release after acidification of non-digested sludge.

Keywords: *Phosphorus, acidification, sludge, heavy metals*

Introduction

The human population will grow to 9.3 billion by 2050, meaning that food production needs to increase accordingly. A high production of agricultural products can only be achieved by the use of fertilizers of