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Heavy metals removal in biological wastewater treatment dependent on process parameters

Erki Lember*, Karin Pachel, Enn Loigu

Department of Environmental Engineering, Tallinn University of Technology, 19086 Tallinn, Estonia, Tel. +372 53585360; email: erkilember@gmail.com (E. Lember), Tel. +372 6202504; email: karin.pachel@ttu.ee (K. Pachel), Tel. +372 6202502; email: enn.loigu@ttu.ee (E. Loigu)

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ABSTRACT

The aim of this study was to analyse the research data collected over a 5-year period, observing the interrelations between the process parameters of an operating wastewater treatment plant and the biosorption and adsorption of heavy metals in activated sludge. In addition, the following daily key parameters of the activated sludge process were determined: hydraulic retention time (HRT), mixed liquor suspended solids (MLSS), sludge retention time (SRT), pH, sludge volume index and dissolved oxygen. In the case of HRT, an inverse linear interrelation was found: the longer the HRT, the less heavy metals accumulated in the activated sludge. The SRT impact assessment revealed that the accumulation of all the metals in the activated sludge was at the highest for SRT periods of 15–19 d. The examination of MLSS concentrations in the range of 3,500–6,000 mg/L indicated that the accumulation in the activated sludge decreased in the given range.

Keywords: Heavy metals; Heavy metals accumulation; Heavy metals in activated sludge; Heavy metals in biological wastewater treatment; Tertiary treatment

* Corresponding author.

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