

Impact of MBR flux enhancer on floc size distribution, dewaterability and shear stability

V. Iversen^a, J. Villwock^a, T. de la Torre Garcia^b, A. Drews^a, M. Kraume^{a*}

^aChair of Chemical Engineering, TU Berlin, Straße des 17. Juni 136, 10623 Berlin, Germany

Tel. +49 30 31423701; +49 30 31421134; email: matthias.kraume@tu-berlin.de

^bBerlin Centre of Competence for Water, Cicerostrasse 24, 10709 Berlin, Germany

Received 15 September 2008; Accepted 9 April 2009

ABSTRACT

This study aims at a better understanding of the effects of flocculants and adsorbents on membrane bioreactor (MBR) mixed liquor. A total of 12 different additives (metal salts, chitosans, starches, synthetic polymers and PAC) were tested with regards to their impact on particle size distribution in activated sludge. Of further interest was the shear stability and dewaterability of sheared sludge. This was tested in a range of shear rates dominating in MBR. For most additives, a significant effect on the capillary suction time (CST) was observed. Most additives formed aggregates that were stable in the tested shear range (0–4000 s⁻¹). Nevertheless, only the tested chitosans and polymers were able to significantly increase the volume based particle size (up to 127%). In order to examine the long term effect of shearing on particle size three of the tested additives were surveyed in pilot plant experiments. Here the increase in particle size was only 17–18% for the tested polymers. In lab scale tests these polymers had caused an increase of approx. 50%.

Keywords: Adsorption; Flocculation; Flux enhancer; MBR; PSD

* Corresponding author.