

Fluid shear influences on flocculation

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Introduction

The tube flocculator is used to study how fluid shear levels affect the settling properties of a flocculated alum-kaolin suspension. FReTA is employed to quantitatively compare the effects of varying fluid shear and hydraulic residence time on the sedimentation velocity distributions and the post-sedimentation residual turbidities of flocculated suspensions formed in the tube flocculator. Results from experiments showed that shear induced floc break up occurred at all velocity gradients evaluated. There is a correlation between high floc settling velocities and low residual turbidities, both of which were optimized at low fluid shear levels and long fluid residence times. This study shows that, for hydraulic flocculation systems, low turbidity water is produced when fluid shear is kept at a minimum.

Results and discussion

All the results and discussion for these experiments can be found in Ian Tse's M.S. thesis: [Fluid shear influences on hydraulic flocculation systems characterized using a newly developed method for quantitative analysis of flocculation performance](#)

During fall 2009, the tube flocc team did one experiment to study of the [effect of shear rate on tube flocculator performance](#). The goal of this experiment was to replicate an experiment from spring 2009 for the team to familiarize itself to the experimental apparatus and analysis techniques. Though this challenge did not provide new data, it showed the overall functions of the tube flocc experimental setup and the computer programs used for data analysis.