

Danhong Luo's Individual Contribution Page

2011Fall Contributions

During the fall 2011 semester, I have worked on the [Tube Flocculator](#) Team. Our goal is to develop a fundamental understanding of flocculation and find the optimal condition for flocculation.

We spent the first portion of the semester studying the relationship between coagulant particle size and the flocculation efficiency. I read some literature about PACl working mechanism, and we assume the smaller coagulant particle size would have higher utilization. We use the filter to get the small size of coagulant, and expect the raw water treated by the vacuum filtered coagulant would have a lower residual turbidity compared with same amount of unfiltered coagulant. But the result was not satisfied and did not show a clear trend or relationship, thus, our team has not been able to progress significantly.

For the second portion of the semester, we began to study ionic strength's influence to the flocculate efficiency. We read some literature about [Debye Length](#) Theory, and sodium, calcium and other ions' influences to the flocculation efficiency. Current research shows tap water which has a high ionic strength performs quite well in flocculation, we are now using the simulation water (by adding controlled chemicals) and try to figure out which group of ion is exactly working for a better performance of flocculation.

2012 Spring Contributions

I am in the team [Stacked Rapid Sand Filtration- Bench](#). This semester we did three studies: self-healing test, depth filtration study and energy dissipation rate study.

In the self-healing test, we found that it is hard to let the sand bed itself control what the flow distribution will be, and the surface removal dominated in the filtration process. The depth filter test reveals that surface removal was dominated in the self-healing test. For the energy dissipation rate test, we assume the filter performance would improved with the increasing energy dissipation rate, while current experiments have not show the result. So further test should be addressed in the energy dissipation rate study.