

## Section 9 Settlement Aids & Phosphorous Removal

In wastewater treatment operations, the processes of coagulation and flocculation are employed to separate suspended solids from water. Finely dispersed solids (colloids) suspended in wastewaters are stabilized by negative electric charges on their surfaces, causing them to repel each other. Since this prevents these particles from colliding to form larger masses, called flocs, they do not settle. To assist in the removal of colloidal particles from suspension, chemical coagulation and flocculation are required. These processes, usually done in sequence, are a combination of physical and chemical procedures. Chemicals are mixed with wastewater to promote the aggregation of the suspended solids into particles large enough to settle or be removed.

Coagulation is the destabilization of colloids by neutralizing the forces that keep them apart. Cationic coagulants provide positive electric charges to reduce their negative charge (zeta potential). As a result, the particles collide to form larger particles (flocs). AR1 and Bio Treat CAS perform this task. Once suspended particles are flocculated into larger particles, they can usually be removed from the liquid by sedimentation, provided that a sufficient density difference exists between the suspended matter and the liquid. Such particles can also be removed or separated by media filtration, straining or floatation.

The addition of such a coagulant can remove suspended solids and remove Biochemical Oxygen Demand from a final effluent. Furthermore, coagulation is the main source of phosphorous removal from wastewater systems in conventional wastewater treatment.

Where larger wastewater plants require large volumes of coagulants in order to form flocs, polymers can be supplied that work in conjunction with them to improve performance.

As a rule of thumb, coagulants are dosed at 100-200 parts per million and flocculants are dosed at 10-20 parts per million