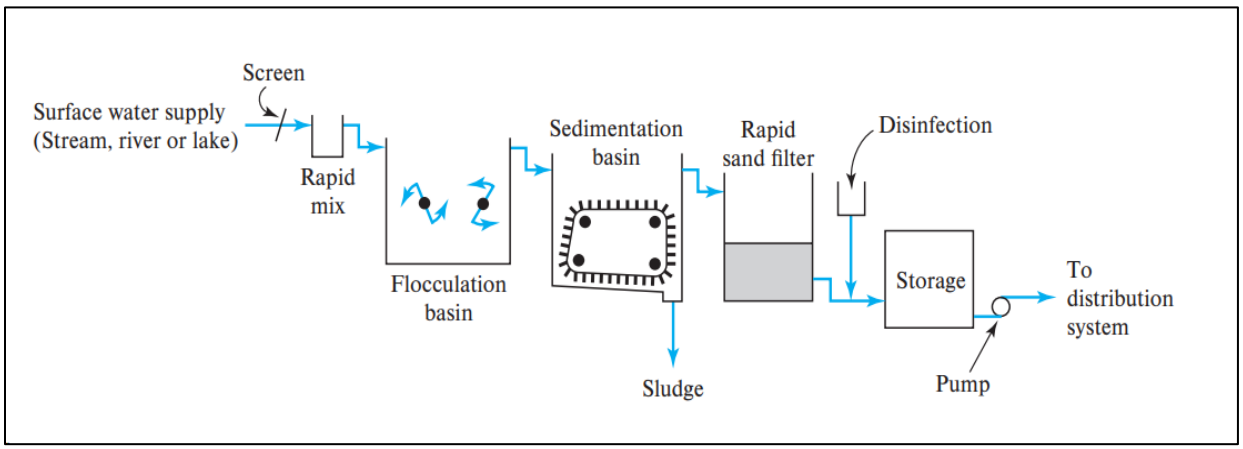
3. Water Treatment Plant (WTP): ***conventional surface water treatment plant***



3.1. Coagulation Tank (Rapid mix)

Coagulation is the destabilization of colloids by addition of chemicals that neutralize the negative charges.

Colloids: clay, algae, microorganisms, organic and inorganic materials …etc. All these matters can be measured by Turbidity test.

Turbidity (NTU): Insoluble particles of soils, microorganism, and other materials impede the passage of light through water by scattering and absorbing the rays. Units of turbidity are Nephelometric turbidity unit (NTU)

Turbidity > 5 NTU can be noticed by visual observation.

Treated drinking water is commonly less than 1 NTU.

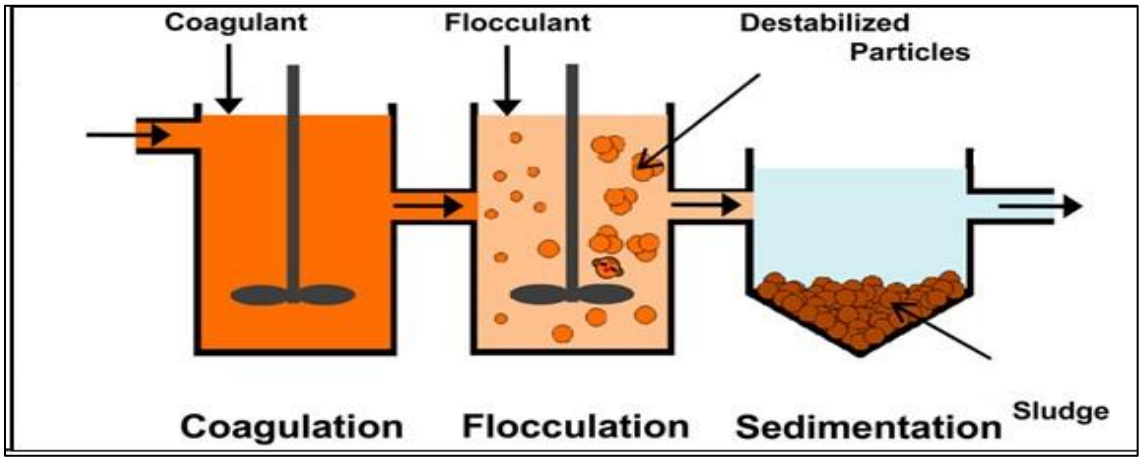
A coagulant has three key properties:

1. Trivalent cation. As discussed previously, naturally occurring colloids are most commonly negatively charged; hence cations are required to achieve charge neutralization.

2. Nontoxic. Obviously, for the production of potable water, the coagulant must be nontoxic.

3. Insoluble in the neutral pH range. High concentrations of the coagulant in treated water are undesirable. Therefore, a coagulant is usually relatively insoluble at the pH values desired.

The two most commonly used metallic coagulants are aluminum (Al^{3+}) and ferric iron (Fe^{3+}). Both meet the preceding three requirements, and their reactions are outlined here.



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