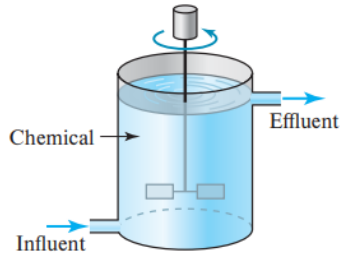


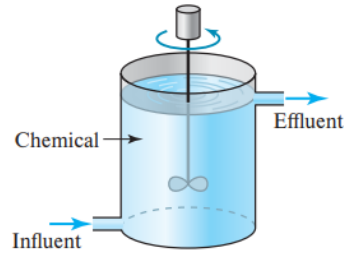


Lecture 3: Water Treatment - Coagulation

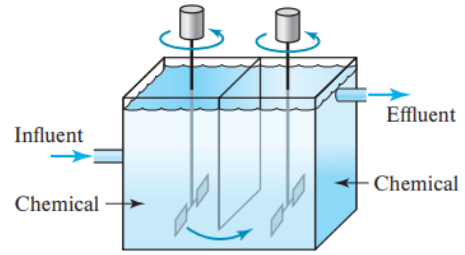
3.2. Design of the coagulation tank



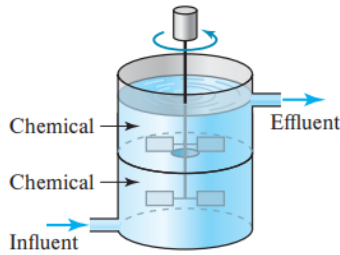
(a) Turbine chamber



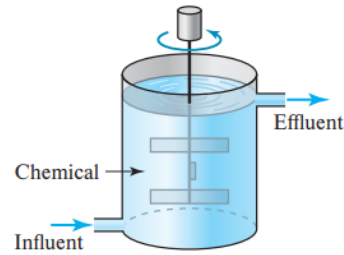
(b) Propeller chamber



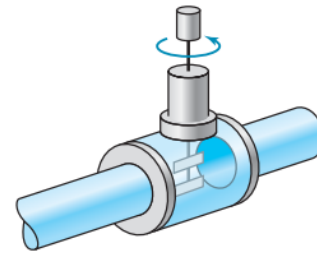
(c) Double-compartment turbine chamber



(d) Double-compartment turbine chamber



(e) Paddle chamber



(f) In-line blender

Power requirements: Power required for turbulent mixing is traditionally based on the velocity gradient or G values proposed by Camp and Stein (1943). The mean velocity gradient G for mechanical mixing is:

$$G = \left(\frac{P}{\mu V} \right)^{1/2}$$

G= velocity gradient, s^{-1} ;

P = Power input, W

V = Tank volume, m^3 ;

μ = Dynamic viscosity, (Pa.s)

- In practice, G values of 3000 to 5000/s are preferable for rapid mixing (ASCE and AWWA, 1990).
- t (time) generally 60 to 120 s.



Environmental Engineering اسم المادة : هندسة البيئة
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عنوان المحاضرة :



Lecture 3: Water Treatment - Coagulation

Example: A rapid mixing tank is 1mx1mx1.2m. The power input is 746 W (1 hp). Find the G value at a temperature of 20 °C.

Example: A square rapid mixing basin with a depth equal to 1.5 times the width is to be designed for a flow of 10000 m³/d. The velocity gradient is to be 3000 s⁻¹, the mixing time is 60 s. Determine the basin dimensions and the power required?