

③

Use 4, 6 vane impeller

$$t_r = 30s \quad h = R = \frac{1}{2} D_{\text{Tank}}$$

} GIVEN

TEXT: $G t_{d, \text{opt}} C^{1.46} = 5.9 \times 10^6$

FOR ALUM

(No eqn given for Fe, but can assume is ~ same)

For 40 mg/L Alum

$$\underline{G \cdot t_d = 27,000}$$

[If you use same eqn for Fe, obtain $G \cdot t_d = 41,000$]

I will just solve for Alum case, since total chemical price ~ same for either coagulant.

Table 13.3: $G = \underline{900 s^{-1}} \quad t_d = 30s \quad (G \cdot t_d = 27,000)$

Need to solve for A) Tank volume & dimensions for $t_d = 30s$
 B) Rotor speed for $G = 900 s^{-1}$

A) $V = Q \cdot t_d = (40,200 \frac{L}{d}) \cdot (30s) (1/86,400 s d^{-1}) = \underline{140 L}$

$$= 0.14 m^3 = h \pi r^2 = \pi r^3$$

↑ since $h = r$

$$r = \sqrt[3]{\frac{0.14 m^3}{\pi}} = 0.35 m$$

$D_{\text{Tank}} = 0.70 m \Rightarrow \text{Impeller } D = 0.7(0.7 m) = \underline{0.5 m}$

Baffle width = $0.10(0.7 m) = 0.07 m = \underline{7 cm}$

SEE
 DIAGRAM
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