

Question #51726, Chemistry, Other

A flow of 1.2 MGD is to be treated with 18 percent solution of hydrofluosilicic acid. The water to be treated contains no fluoride and the desired fluoride concentration is 1.4 mg/L. Assume the hydrofluosilicic acid weighs 9.5 pounds per gallon and 79.2 percent fluoride purity of the acid. What is the hydrofluosilicic acid feed rate in gallons per day?

Answer:

1 pound = 0.45 kg

1 gallon = 3.78 l

$$\text{Acid density} = \frac{9.5 \cdot 0.45}{3.78} = 1.13 \text{ kg / l}$$

$$Q = \frac{1,200,000 \cdot 1.4}{0.792} = 2,121,212 \text{ mg / d} = 2.121 \text{ kg / d}$$

$$Q_m = \frac{2.121 \text{ kg / d} \cdot 100}{18} = 11.78 \text{ kg / d}$$

$$Q_v = \frac{11.78}{1.13} = 10.42 \text{ l / d} = 2.76 \text{ gal / d}$$