In Class Post Quiz 1 Pre-Quiz 2—Environmental Measurements

CENG 340–Introduction to Environmental Engineering
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What are PVC pipes made from?

Vinyl Chloride, C_2H_3Cl

The Environmental Protection Agency regulates vinyl chloride (VC) under the Clean Air Act and the Safe Drinking Water Act. VC has an MCL of 0.002 ppm_m and a 3-h outdoor air quality standard of 10 ppm_v.

A manager of a facility that produces polyvinyl chloride (PVC) informs you that a malfunctioning valve caused 60 g of VC to be discharged into an indoor swimming pool. **She wants to know if the resulting concentrations of VC in the water and air violate the MCL and outdoor air quality standard, respectively.**

Since VC is very volatile, assume that 58 g of the VC volatilzed out of the water into the air surrounding the indoor pool, and 2 g remained dissolved in water. (Note that next week you will learn to calculate how volatile compounds like VC partition between air and water.)

Additional useful information:

1. The pool has a volume of 100 m^3 and the indoor pool area has an air volume of 1000 m^3.
2. Temperature and pressure equal 25 ^{0}C and 1 atm, respectively.
3. Temperature in Kelvin (K) = temperature in degrees Celsius (^{0}C) + 273.15;
4. MW_C = 12 g/mole; MW_H = 1 g/mole; MW_{Cl} = 35.5 g/mole
5. The ideal gas constant R = 8.205×10^{-5} $\frac{m^3 \times atm}{mole \times Kelvin}$.