Answer on Question #55213 – Chemistry – General chemistry

Question:

1-If you place 5-grams of chlorine in 15-centiliters of deionized water, what is its molarity? Hint: Cl molar mass is 34.45 g/mol, 1 cm = 1 $x10^{-2}$ meter, SHOW YOUR WORK AND INCLUDE UNITS
2-If the absorbance of a low concentration solution is 0.62, then we would expect the absorbance of the same solution at a higher concentration to be greater. True or False. Explain?

Answers:

1. C (M),molarity = n (moles) / V (L)
   n (moles) = m (g) / Mw (g/moles)
   C (M), molarity = m (g) / (Mw (g/moles) × V (L))

1 cL = 0.01 L

15 cL = 0.15 L

C (M) = 5 (g) / (34.45 (g/mole) × 0.15 (L)) = 0.9676 (M)

Answer has to be rounded to 0.1 M

Molarity of chlorine is 0.1 M

*if you mean molecular chlorine Mw = 68.9 g/mol, then C = 0.05 M

2. True

As Beer–Lambert–Bouguer law states:

$A = \varepsilon \times c \times l$

It means that absorbance is proportional to concentration. If we keep all the parameters, except concentration, constant:

$A \sim c$

Increase of concentration leads to increase of absorbance.