Answer on Question #55230 - Chemistry - General chemistry

Question:

A student performs the following gravimetric analysis of iron ions in a water system:Fe2+ (aq) + 2CO$_3$2- (aq) = FeCO3 (s)If this student used excess carbonate and obtained the following data, what was the original concentration in moles/L) of Fe2+ in the water sample?Total Volume of Solution: 100.00 mLMass of FeCO3 collected: 23.758 grams.Is this how you would solve it change 100 ml to .1 liters. 115.853x = 23.758 x .1 = .02 liters

Answer:

Not actually.

First of all in this calculation you have to pay significant attention to significant figures.

When you are transforming units, the result is as following

100.00 mL = 0.10000 L (5 significant figures)

m = 23.758 g (5 significant figures)

You have to use the scientific way of thinking — calculate the quantity of substance and then concentration

$n(Fe^{2+}) = n(FeCO_3) = m(FeCO_3)/Mw(FeCO_3)$

$Mw(FeCO_3) = 115.8539$ (7 significant figures)

$n(Fe^{2+}) = 23.758/115.8538 = 0.20507$ moles (5 significant figures)

$c(Fe^{2+}) = n(Fe^{2+})/V = 0.20507/0.10000 = 2.0507$ moles/L (5 significant figures)