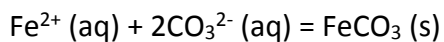# Answer on Question #55228 - Chemistry - General chemistry

Question:

A student performs the following gravimetric analysis of iron ions in a water system:

Fe^{2+} (aq) + $2CO_3^{2-}$ (aq) = $FeCO_3$ (s)

If this student used excess carbonate and obtained the following data, what was the original concentration in moles/L) of Fe^{2+} in the water sample?

Total Volume of Solution: 100.00 mL

Mass of $FeCO_3$ collected: 23.758 grams.

Answer:

If student has used excess of carbonate, all the Fe^{2+} ions are precipitated in form of $FeCO_3$. It means that number of moles of obtained carbonate is equal to quantity of ions Fe^{2+}.

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

$c (Fe^{2+}) = n (Fe^{2+})/V = m (FeCO_3)/(Mw(FeCO_3)×V) = 23.758$ (g)/(115.8539 (g/moles) ×0.10000 L) = 2.0507 moles/L

Original concentration was 2.0507 moles/L