

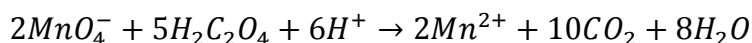
## Answer on the question #67038, Chemistry / Physical Chemistry

### Question:

100mL of oxalic acid requires 35mL of 0.04 M  $KMnO_4$  to titrate it to the end point. Calculate the molarity of the oxalic acid.?

### Solution:

The reaction equation is:



Thus, 2 moles of  $KMnO_4$  reacts with 5 moles of  $H_2C_2O_4$ . So, the relation of their number of the moles is the following:

$$\frac{n(KMnO_4)}{2} = \frac{n(H_2C_2O_4)}{5}$$

Let's calculate the number of the moles of potassium permanganate:

$$n(KMnO_4) = c(KMnO_4) \cdot V(KMnO_4) = 0.04(M) \cdot 35 \cdot 10^{-3}(L) = 1.4 \cdot 10^{-3}(mol)$$

So, the number of the moles of oxalic acid is:

$$n(H_2C_2O_4) = n(KMnO_4) \cdot \frac{5}{2} = 1.4 \cdot 10^{-3}(mol) \cdot \frac{5}{2} = 3.5 \cdot 10^{-3}(mol)$$

Then, dividing the number of the moles by the volume of oxalic acid solution, we get the concentration:

$$c(H_2C_2O_4) = \frac{n(H_2C_2O_4)}{V(H_2C_2O_4)} = \frac{3.5 \cdot 10^{-3}(mol)}{100 \cdot 10^{-3}(L)} = 0.035(M)$$

**Answer:** 0.035M

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