Question #58432, Chemistry / General Chemistry

What is the molarity of a MnO4- solution if 23.5 mL of this solution is required to react completely with 30.0 mL of 0.134 M Fe2+ solution according to the equation 5Fe2+(aq) + MnO4-(aq) + 8H+(aq) --> 5Fe3+(aq) + Mn2+(aq) + 4H2O(l)

Answer

$$C_1 \cdot V_1 = C_2 \cdot V_2$$

$$C_x \cdot 23.5 = 0.134 \cdot 30$$

$$C_x = \frac{0.134 \cdot 30}{23.5} = 0.171M$$

$$5moleFe^{2+} : 1moleMnO_4^-$$

$$C_M(MnO_4^-) = \frac{0.171}{5} = 0.0342M$$

$$Answer : [C] = 0.0342M$$