

How many grams of  $\text{KMnO}_4$  are needed to make 750.0 mL of a 0.175 M solution

**Solution:**

$$C(\text{KMnO}_4) = 0.175 \text{ M}$$

Concentration is the amount of moles of the following substance ( $\text{KMnO}_4$ ) in one liter of the solution (the amount of moles can be represented as mass divided by the molar mass). It is expressed by the formula given below. The mass  $m(\text{KMnO}_4)$  can be obtained from this formula as follows:

$$C(\text{KMnO}_4) = \frac{m(\text{KMnO}_4)}{M(\text{KMnO}_4)V(\text{solution})};$$

$$m(\text{KMnO}_4) = C(\text{KMnO}_4)M(\text{KMnO}_4)V(\text{solution}) = 0.175(\text{mol/l}) * 158(\text{g/mol}) * 0.750(\text{l}) = 20.74 \text{ g}$$

**Answer:  $m(\text{KMnO}_4) = 20.74 \text{ g}$**