A pipette was used to deliver 19.05 mL of HCl to a flask that was subsequently titrated against NaOH. The concentration of NaOH was 0.1046 ± 0.0003 M. The volume of NaOH delivered from the burette was 19.48 ± 0.049 mL. Calculate the concentration of HCl. Please report an answer accurate to four decimal places. Report your answer in mol/L (M) but do not include the units when entering your answer and do not use Scientific notation.

Solution:

We calculate the required concentration of HCl according to the law of multiple proportions:

$N(NaOH) \times V(NaOH) = N(HCl) \times V(HCl)$, N – Normality.

$$N(HCl) = M(HCl) = \frac{0.1046 \times 19.48}{19.05} = 0.1070M$$

Answer: 0.1070.