Answer on Question #83537 – Chemistry – Physical Chemistry

Imagine you start with a 1.40 M stock solution and then take 59.0 mL of the stock solution and dilute it to a total volume of 238 mL. You then take a 119 mL aliquot of that solution and dilute it by adding 143 mL of water. What are the concentrations of the second and final solutions?

Solution:

C = 1.40 mol/L

1.40 mol – 1000 mL

x mol – 59.0 mL

x = 0.0826 mol

V_2 = 59.0 mL + 238 mL = 297 mL = 0.297 L

C_2 = 0.0826 mol / 0.297 L = 0.278 mol/L

0.278 mol – 1000 mL

x mol – 119 mL

x = 0.033 mol

V_f = 119 mL + 143 mL = 262 mL = 0.262 L

C_f = 0.033 mol / 0.262 L = 0.126 mol/L