How many grams of $FeCl_3$ should I use to produce 250 mL of a 0.50 M solution?

$mol = M \times L = (0.50\,M)(0.25\,L) = 0.125\,mol$

$FeCl_3$ — 162.20 g/mol

$0.125\,mol \times \frac{162.20\,g}{1\,mol} = 20.28\,g\ FeCl_3$

57.0 mL of a 0.1 M $FeCl_3$

IF I evaporate to dryness, how many grams of $FeCl_3$ (s) would remain in my dish?

$mol = M \times L = (0.1\,M)(0.057\,L) = 0.0057\,mol$

$0.0057\,mol \times \frac{162.20\,g}{1\,mol} = 0.92\,g\ FeCl_3$

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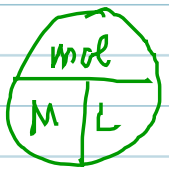

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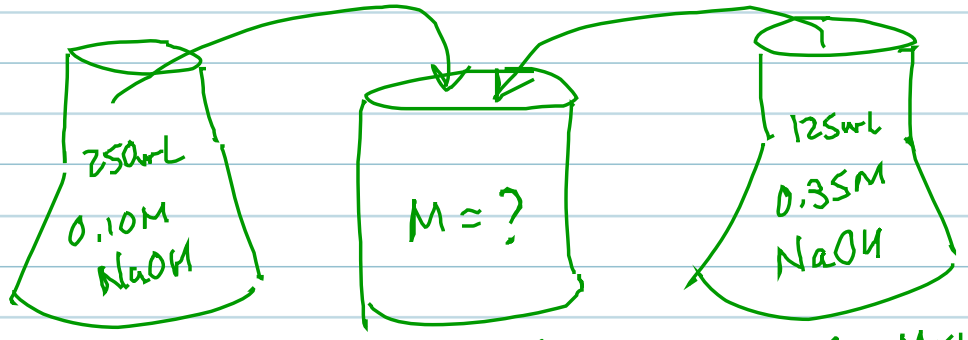
What is the new molarity of the solution made by mixing 250 mL of 0.10M NaOH with 125 mL of 0.35 M NaOH?



mol = M x L
= (0.10M)(0.25L)
= 0.025 mol NaOH

$M = \frac{mol}{L}$

L = 250mL + 125mL
= 375mL = 0.375L

mol = M x L
= (0.35M)(0.125L)
= 0.044 mol NaOH

total moles = 0.025 mol + 0.044 mol = 0.069 mol NaOH

$M = \frac{0.069\ mol}{0.375\ L} = 0.18\ M\ NaOH$

DILUTING A SOLUTION
→ adding more solvent V ↑ M ↓ moles of solute STAYS THE SAME

moles before = moles after

M x L = M x L

$M_1V_1 = M_2V_2$ dilution equation

50mL of 0.5M NaOH
new V = 250mL
new M = ?

$M_1 = 0.5M$
$V_1 = 50mL$
$M_2 = ?$
$V_2 = 250mL$

$M_2 = \frac{M_1V_1}{V_2} = \frac{(0.5M)(50mL)}{250mL}$

$M_2 = 0.1\ M$

$MgSO_4$ 120.38 g/mol

500 mL of 0.5M $MgSO_4$ solution

$mol = M \times L = (0.5M)(0.5L) = 0.25 mol$

$$0.25 mol \times \frac{120.38 g}{1 mol} = 30.10 g\ MgSO_4$$

using your solution, make 100 mL of 0.2M $MgSO_4$

$M_1 = 0.5M$
$V_1 = ?$
$M_2 = 0.2M$
$V_2 = 100 mL$

$M_1V_1 = M_2V_2$

$$V_1 = \frac{M_2V_2}{M_1} = \frac{(0.2M)(100mL)}{0.5M}$$

$V_1 = 40 mL$ of 0.5M

+

60 mL H_2O