Answer on Question #67340, Chemistry / General Chemistry

You need to prepare 100 mL of a 0.5 M solution of LiCl.
You have 50 mL of a 0.65 M LiCl solution and 20 mL of a 5% (w/v) LiCl solution.

- Molar mass of LiCl = 42.39 g/mol
- % (weight / volume) means mass (in g) in volume (100 mL)

What volume of 5% LiCl and water needs to be added to the 50 mL of 0.65 M LiCl solution to make up 100 mL of 0.5 M LiCl?

Answer

$C_1=ϑ_1/V_1;ϑ_1=C_1*V_1=0.5Mol/L=0.05Mol$

$m_1=0.05Mol*42.39=2.12g$

$W_1=2.12\%$

$C_2=ϑ_2/V_2;ϑ_2=0.65Mol/L*0.05L=0.0325Mol$

$m_2=0.0325Mol*42.39=1.3777g$

$m_3=5g*20Ml/100Ml=1g;ϑ_3=1g/42.39g/mol=0.0236m$

$ϑ=ϑ_2+ϑ_3=0.0325+0.0236=0.0561Mol$

$V=V_2+V_3=50+20=70ml$

$m=0.0561Mol*42.39g/mol=2.378g$

$W=3.397\%$

3.397% 2.12parts

2.12

0%(H_2O) 1.277parts

$V=2.12*100/3.397=62$

$V(H_2O)100-62=38ml$