Answer on Question #68147 - Chemistry - General Chemistry

Question:

What mass (in grams) of calcium nitrate is present in 400.0mL of a 0.150 M solution?

Solution:

Molarity shows the number of moles of solute in 1000 mL of a solution.

So in our case 0.150 M solution has 0.150 moles of calcium nitrate in 1000 mL of solution. Than 400.0 mL of solution contains (0.150 mol / 1000 mL) * 400.0 mL = 0.06 mol of calcium nitrate.

To convert moles into grams we have to remember that 1 mole of substance contains amount of grams equal to molecular mass of the substance.

Now find the molecular mass of calcium nitrate $Ca(NO_3)_2$:

$M(Ca(NO_3)_2) = 40.1 + ((14.0 + 16.0 * 3) * 2) = 164.1$

So 1 mole of calcium nitrate contains 164.1 g of substance. Than 0.06 moles contain 164.1 * 0.06 = 9.8 g.

Answer:
9.8 g of calcium nitrate.