

>> How many moles of chloride ions are in 3.5 liters of blood, which has a concentration of 110 milliequivalents of chloride per liter? We put-written down our information. We have 3.5 liters of blood. Concentration is 110 milliequivalents of the chloride ion for every liter of blood. Our question is, how many moles of chloride ion will that be? Now, looking at what we're talking about, we're talking about chloride ions, it has a negative 1 charge. With that negative 1 charge, that tells us that 1 mole of chloride ions equals 1 equivalent of chloride ions. Okay, this is much like the last problem we worked. We're going to be using this equality also. And we're using the same plan going from liters to milliequivalents to equivalents to moles. This time, though, we're starting with the 3.5 liters. Our equivalent here, our concentration is 110 milliequivalents per liter. So we're able to cancel out liters, and we end up with 390 milliequivalents of chloride. Second step, going from milliequivalents to equivalents, we're starting, again, with our 390 milliequivalents, multiplying by the 1 equivalent, dividing by 1,000 milliequivalents. Milliequivalents cancel. We end up with 390 divided by 1,000, or .39 equivalents of chloride. Last time, going from equivalents to moles using this right here, our .39 equivalents, we have 1 mole of chloride over 1 equivalent of chloride ion. Again, you can see we're going to be canceling the equivalents of chloride ion, ending up with moles as our units. Our answer is .39 moles of chloride. Now, one thing I want to mention, both of our problems we worked with had, we had ions that had a negative 1 or a positive 1 charge. What happens when we work with something that has a different charge, like calcium? Calcium ion has a plus 2 charge. The only difference, working with something that has a different type of charge, is that now, because of that 2, 1 mole will equal 2 equivalents. So we would work the problem the same way until we got to this step right here. Our conversion factor at this point, if we're working with calcium 2 plus, would be 1 mole of calcium over 2 equivalents, and that would be the only difference.