(a) n1(HCl) = C*V = 0.024L*0.1mol/L = 0.0024 mol
n2(HCl) = C*V = 0.01L*0.22mol/L = 0.0022 mol
$HCl \rightarrow H^+ + Cl^-$
n1(H+) = 0.0024 mol
n2(H+) = 0.0022 mol
n1(Cl-) = 0.0024 mol
n1(Cl-) = 0.0022 mol
C(H+) = (0.0024 + 0.0022)mol / (0.024 + 0.01)L = 0.0046mol/0.034L = 0.1353 M
C(Cl-) = (0.0024 + 0.0022)mol / (0.024 + 0.01)L = 0.0046mol/0.034L = 0.1353 M
(b) n(Na2SO4) = C*V = 0.015L*0.3mol/L = 0.0045 mol
n1(NaCl) = C*V = 0.0256L*0.1mol/L = 0.00256 mol
$Na_2SO4 \rightarrow 2Na^+ + SO_4^{2-}$
$NaCl \rightarrow Na^+ + Cl^-$
n1(Na+) = 0.0045*2 = 0.009 mol
n2(Na+) = 0.00256 mol
n(Cl-) = 0.00256 mol
$n(SO_4^{2-})$ = 0.0045 mol
V = 0.015 + 0.0256 = 0.0406 L
C(Na+) = (0.009+0.00256)mol/0.0406L = 0.2847 M
C(Cl-) = 0.00256mol/0.0406L = 0.0631 M
$C(SO_4^{2-})$ = 0.0045 mol/0.0406L = 0.1108 M
(c) n(CaCl2) = C*V = 0.06L*0.434mol/L = 0.026 mol
n(KCl) = 3.5g/74.5g/mol = 0.047 mol
$KCl \rightarrow K^+ + Cl^-$
$CaCl_2 \rightarrow Ca^{2+} + 2Cl^-$
n(Ca2+) = 0.026 mol
n(Cl-) = 0.026*2 +0.047 = 0.099 mol
n(K+) = 0.047 mol
C(Ca2+) = 0.026 mol/0.06 L = 0.433 M
C(Cl-) = 0.099 mol/0.06 L = 1.65 M
C(K+) = 0.047 mol/0.06 L = 0.783 M