

17 charge and mass are proportional to molarity, not activity

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$$[H^+] + 2[Ca^{2+}] + [Ca(HCO_3)^+] + [Ca(OH)^+] + [K^+] = [OH^-] + [HCO_3^-] + 2[CO_3^{2-}] + [ClO_4^-]$$

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$$[H^+] = 2[SO_4^{2-}] + [HSO_4^-] + [OH^-]$$

20 a. charge:

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$$2[Mg^{2+}] + [MgBr^+] + [MgOH^+] + [H^+] = [Br^-] + [OH^-]$$

mass:

$$[Br^-] + [MgBr^+] = 2([Mg^{2+}] + [MgBr^+] + [MgOH^+])$$

b.  $0.2M = [Mg^{2+}] + [MgBr^+] + [MgOH^+]$

$$0.4M = [Br^-] + [MgBr^+]$$

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$$0.1M = [CH_3CO_2^-] + [CH_3CO_2H]$$

$$3([Fe^{3+}] + [Fe(OH)^{2+}] + 2[Fe_2(OH)_2^{4+}] + [FeSO_4^+]) + [Fe(OH)_2^+]$$

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$$= 2([SO_4^{2-}] + [HSO_4^-] + [FeSO_4^+])$$