Chapter 3 Practice Problem Key

**3.35**

a. a period 2 element that forms a +2 cation = Be

b. an ion from group 7A with 18 electrons = Cl–

c. a cation from group 1A with 36 electrons = Rb+

**3.39**

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| a. sodium ion = Na+ | c. manganese ion = Mn2+ | e. stannic = Sn4+ |
| b. selenide = Se2– | d. gold(III) = Au3+ | f. mercurous = Hg22+ |

**3.45** Ions that contain an outer shell of eight electrons are likely to form.

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| a. S– No, only seven  electrons in outer shell | c. S3– No, one electron in outer  shell | e. Na2+ No, only seven electrons  in outer shell |
| b. S2– Likely to form | d. Na+ Likely to form | f. Na– No, two electrons in outer  shell |

**3.49** a. sulfate, SO42– b. nitrite, NO2– c. sulfide, S2–

**3.63**

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|  | **Y**– | **Y**2– | **Y**3– |
| **X**+ | **XY** | **X**2**Y** | **X**3**Y** |
| **X**2+ | **XY**2 | **XY** | **X**3**Y**2 |
| **X**3+ | **XY**3 | **X**2**Y**3 | **XY** |

**3.73**

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| a. FeCl2 = iron(II) chloride, ferrous chloride | c. FeS = iron(II) sulfide, ferrous sulfide |
| b. FeBr3 = iron(III) bromide, ferric bromide | d. Fe2S3 = iron(III) sulfide, ferric sulfide |

**3.79**

|  |  |  |
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| a. NH4Cl = ammonium  chloride | c. Cu(NO3)2 = copper(II) nitrate,  cupric nitrate | e. Fe(NO3)2 = iron(II) nitrate,  ferrous nitrate |
| b. PbSO4 = lead(II) sulfate | d. Ca(HCO3)2 = calcium  bicarbonate, calcium  hydrogen carbonate |  |

**3.83**

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| a. OH– = Pb(OH)4  lead(IV) hydroxide | c. HCO3– = Pb(HCO3)4  lead(IV) bicarbonate | e. PO43– = Pb3(PO4)4  lead(IV) phosphate |
| b. SO42– = Pb(SO4)2  lead(IV) sulfate | d. NO3– = Pb(NO3)4  lead(IV) nitrate | f. CH3CO2– = Pb(CH3CO2)4  lead(IV) acetate |

**3.91**

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| Cation | a. Number of Protons | b. Number of Electrons | c. Noble Gas | d. Role |
| Na+ | 11 | 10 | Ne | Major cation in extracellular fluids and blood; maintains blood volume and blood pressure |
| K+ | 19 | 18 | Ar | Major intracellular cation |
| Ca2+ | 20 | 18 | Ar | Major cation in solid tissues like bone and teeth; required for normal muscle contraction and nerve function |
| Mg2+ | 12 | 10 | Ne | Required for normal muscle contraction and nerve function |

**3.93** silver (Ag+) nitrate (NO3–) = AgNO3