CONCEPT: PERIODIC TREND: RANKING IONIC RADII

- When ranking ionic radii you must determine the total number of electrons for atoms and ions.
  - □ Recall, *isoelectronic* species are atoms or ions that have the same number of electrons.

EXAMPLE: Arrange the atoms and/or ions in order of decreasing ionic radius: Fe^{2+}, Mn^{+}, Ni^{2+}, Zn^{2+}.

STEP 1: Determine the total number of **electrons** for each element or ion.

- □ _____ the number of electrons = _____ ionic radius.

STEP 2: If the atoms or ions have equal electrons (isoelectronic): ____ negative charge = ____ ionic radius.

Isoelectronic Species

□ **For isoelectronic species**: The ____ negative the charge, the ____ ionic radius.

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PRACTICE: Arrange the following atoms and/or ions in the order of increasing size: Br^{-}, Kr, Rb^{+}, Sr^{2+}.

PRACTICE: Arrange the following isoelectronic series in order of decreasing radius: F^{-}, O^{2-}, Mg^{2+}, Na^{+}.

PRACTICE: For an isoelectronic series of ions, the ion that is the smallest is always

a) The ion with the fewest protons.

b) The least positively charged ion.

c) The ion with the highest atomic number.

d) The ion with the most neutrons.

e) The ion with the most electrons.