ConcepTest Dealing with Electron Configurations of Ions:

"Iodized salt" is table salt (NaCl) supplemented with potassium iodide, which is made of the ions, K^+ and I^- . What is the electron configuration of the cation, K^+ ?

1. $1s^2\ \ 2s^2\ 2p^6\ \ 3s^2\ 3p^6\ \ 4s^1$
2. $1s^2\ \ 2s^2\ 2p^6\ \ 3s^2\ 3p^6\ \ 4s^2$
3. $1s^2\ \ 2s^2\ 2p^6\ \ 3s^2\ 3p^6$
4. none of the above.

Correct Answer: **3.** $1s^2\ 2s^2\ 2p^6\ \ 3s^2\ 3p^6$

Comment to Instructor: Choice 1 is the e-config. of K. It indicates students forgot that K^+ has one less electron than K. Choice 2 indicates students <u>added</u> an extra electron instead of removing one electron from K.

What is the electron configuration of the anion, I^-?

1. $1s^2\ \ 2s^2\ 2p^6\ \ 3s^2\ 3p^6\ \ 4s^2\ 4d^{10}\ 4p^6\ \ 5s^2\ 5d^{10}\ 5p^5$
2. $1s^2\ \ 2s^2\ 2p^6\ \ 3s^2\ 3p^6\ \ 4s^2\ 4d^{10}\ 4p^6\ \ 5s^2\ 5d^{10}\ 5p^6$
3. $1s^2\ \ 2s^2\ 2p^6\ \ 3s^2\ 3p^6\ 3d^{10}\ \ 4s^2\ 4p^6\ 4d^{10}\ \ 5s^2\ \ 5p^6$
4. $1s^2\ \ 2s^2\ 2p^6\ \ 3s^2\ 3p^6\ \ 4s^2\ 3d^{10}\ 4p^6\ \ 5s^2\ \ 4d^{10}5p^6$

Correct Answer: **3. $1s^2\ \ 2s^2\ 2p^6\ \ 3s^2\ 3p^6\ 3d^{10}\ \ 4s^2\ 4p^6\ 4d^{10}\ \ 5s^2\ \ 5p^6$**
and 4. $1s^2\ \ 2s^2\ 2p^6\ \ 3s^2\ 3p^6\ \ 4s^2\ 3d^{10}\ 4p^6\ \ 5s^2\ 4d^{10}5p^6$

Comment to Instructor: Choices 3 and 4 are the same. Some instructors prefer to have students group the notations by period number (Choice 1). Some instructors prefer to have students list notations in the order presented in the periodic table (Choice 4). Choice 1 indicates students forgot that the d section starts with n=3, not 4, and also forgot that they are considering iodide anion and not the neutral iodine atom. Choice 2 indicates students remembered to add one extra electron, but forgot that the d section starts with n=3, not 4.
