

Answer to Question #50632, Chemistry, Other

Which of the following three sets consist of atoms or ions with the same electron configuration in the ground state?

(I) O^{2-} , Ne, and Mg^{2+}

(II) Ni, Cu^+ , and Zn^{2+}

(III) Hg, Tl^+ , and Pb^{2+}

Solution:

(I) O^{2-} [He] $2s^2 2p^6$,

Ne [He] $2s^2 2p^6$

Mg^{2+} [Ne] $3s^0$ or [He] $2s^2 2p^6$

(II) Ni [Ar] $3d^8 4s^2$

Cu^+ [Ar] $3d^{10} 4s^0$

Zn^{2+} [Ar] $3d^{10} 4s^0$

(III) Hg [Xe] $4f^{14} 5d^{10} 6s^2$

Tl^+ [Xe] $4f^{14} 5d^{10} 6s^2 6p^0$

Pb^{2+} [Xe] $4f^{14} 5d^{10} 6s^2 6p^0$

Answer:

The same electron configuration in the ground state has (I) O^{2-} , Ne, and Mg^{2+} and (III) Hg, Tl^+ , and Pb^{2+} .