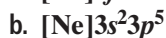
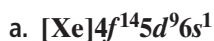


Finally, describe whether each element has high reactivity or low reactivity.



SOLUTION

- The $4f$ sublevel is filled with 14 electrons. The $5d$ sublevel is partially filled with nine electrons. Therefore, this element is in the d block. The element is the transition metal platinum, Pt, which is in Group 10 and has a low reactivity.
- The incompletely filled p sublevel shows that this element is in the p block. A total of seven electrons are in the ns and np sublevels, so this element is in Group 17, the halogens. The element is chlorine, Cl, and is highly reactive.
- This element has a noble-gas configuration and thus is in Group 18 in the p block. The element is argon, Ar, which is an unreactive nonmetal and a noble gas.
- The incomplete $4f$ sublevel shows that the element is in the f block and is a lanthanide. Group numbers are not assigned to the f block. The element is samarium, Sm. All of the lanthanides are reactive metals.

PRACTICE

Answers in Appendix E

- For each of the following, identify the block, period, group, group name (where appropriate), element name, element type (metal, nonmetal, or metalloid), and relative reactivity (high or low):
 - $[\text{He}]2s^22p^5$
 - $[\text{Ar}]3d^{10}4s^1$

extension

Go to go.hrw.com for more practice problems that ask you to locate elements on the periodic table and predict their properties based on their electron configurations.



Keyword: HC6PERX

SECTION REVIEW

- Into what four blocks can the periodic table be divided to illustrate the relationship between the elements' electron configurations and their placement in the periodic table?
- What name is given to each of the following groups of elements in the periodic table?
 - Group 1
 - Group 2
 - Groups 3–12
 - Group 17
 - Group 18
- What are the relationships between group configuration and group number for elements in the s , p , and d blocks?
- Without looking at the periodic table, write the outer electron configuration for the Group 15 element in the fourth period.

- Without looking at the periodic table, identify the period, block, and group of the element that has the electron configuration $[\text{Ar}]3d^74s^2$.

Critical Thinking

- APPLYING MODELS** Period 7 contains elements in the s , p , d , and f blocks. Suppose that there were a Period 8 and it contained elements in the "g" block, where "g" had the angular momentum quantum number $\ell = 4$. If a hypothetical element in Period 8 had an atomic number of 120, into what group in the periodic table would the element fit, and what properties might it have (assuming it does not radioactively decay)?