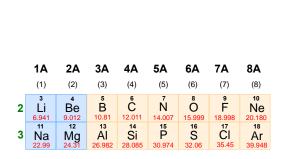
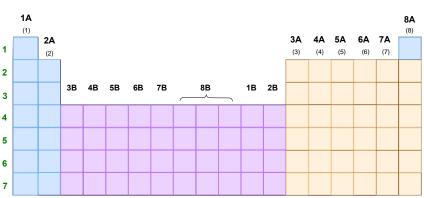
## **CONCEPT:** THE 18 AND 16 ELECTRON RULE

Remember main-group elements want to follow the octet rule.





- In transition-metal chemistry, we use the 18 and 16-electron rule as an indicator for the reactivity of the transition metal.
  - ☐ The most stable transition-metal complexes in several cases have electron counts of \_\_\_\_\_ electrons.
    - □ This trend is called the \_\_\_\_ electron rule.
    - □ This most stable number of electrons represents the number of total \_\_\_\_\_, \_\_\_\_, & \_\_\_\_\_ electrons.

1 <b>A</b>	2A	3B	4B	5B	6B	7B	8B	1B	2B	3A	4A	5A	6A	7A	8A
(1)										(3)	(4)	(5)	(6)	(7)	(8)



## **18-Electron Rule Exceptions**

- Exceptions happen most often with transition metals from the \_\_\_\_\_ to \_\_\_\_ valence electron groups.
  - $\hfill\Box$  The tendency of these metals to be happy with 16 electrons is called the \_\_\_\_ - electron rule.
  - and \_\_\_\_ are the most common examples of transition metals following this rule.

**EXAMPLE:** What is the electron count of the neutral transition metal complex of Br<sub>2</sub>Pd(CO)<sub>2</sub>?

**EXAMPLE:** What is the electron count of the neutral transition metal complex of Pd(en)<sub>2</sub>?

CONCEPT: THE 18 AND 16 ELECTRON RULE  PRACTICE: How many NH <sub>3</sub> ligands would need to be placed onto a nickel atom if we assume the resulting complex follows the 18-electron rule?
PRACTICE: Using the 18-electron rule, explain why V(CO) <sub>6</sub> can be easily reduced to [V(CO) <sub>6</sub> ]⁻.