

Unit 4 Outline Companion Notes to 6E Video

Student Expectation 6E -- Express the arrangement of electrons in atoms through electron configurations and Lewis valence electron dot structures.

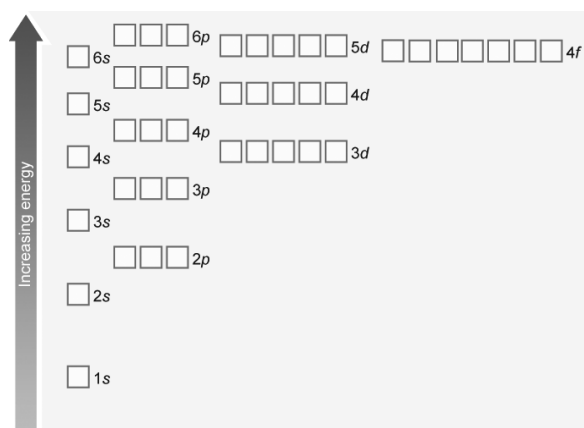
Slide 1 - How can you express the arrangement of electrons in atoms through electron configurations? What are the three rules?

- 1.
- 2.
- 3.

Slide 2 – Aufbau Principle states: _____

List the sublevels and how many orbitals are in each one:

Slide 3 - Aufbau Diagram - Study the diagram. What is the lowest-energy sublevel?



Slide 4 – Pauli exclusion principle states _____

Slide 5 – Spin is _____

Slide 6 – Hund's Rule states _____

Draw an example of three electrons filling three orbitals of equal energy.

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Slide 7

| Electron Configurations of Selected Elements | | | | | | | |
|--|----|----|-----------------|-----------------|-----------------|----|---|
| Element | 1s | 2s | 2p _x | 2p _y | 2p _z | 3s | Electron configuration |
| H | ↑ | □ | □ | □ | □ | □ | 1s ¹ |
| He | ↑↓ | □ | □ | □ | □ | □ | 1s ² |
| Li | ↑↓ | ↑ | □ | □ | □ | □ | 1s ² 2s ¹ |
| C | ↑↓ | ↑↓ | ↑ | ↑ | □ | □ | 1s ² 2s ² 2p ² |
| N | ↑↓ | ↑↓ | ↑ | ↑ | ↑ | □ | 1s ² 2s ² 2p ³ |
| O | ↑↓ | ↑↓ | ↑↓ | ↑ | ↑ | □ | 1s ² 2s ² 2p ⁴ |
| F | ↑↓ | ↑↓ | ↑↓ | ↑↓ | ↑ | □ | 1s ² 2s ² 2p ⁵ |
| Ne | ↑↓ | ↑↓ | ↑↓ | ↑↓ | ↑↓ | □ | 1s ² 2s ² 2p ⁶ |
| Na | ↑↓ | ↑↓ | ↑↓ | ↑↓ | ↑↓ | ↑ | 1s ² 2s ² 2p ⁶ 3s ¹ |

Slide 8 – Writing Electron Configurations

The order in which electrons fill the orbitals in the sublevels is as follows:

1s, 2s, 2p, 3s, 3p, 4s, 3d, 4p, 5s, 4d, 5p and so forth. The d block is _____ energy level _____ than that of the s and p blocks.

Slide 9 – Valence electrons are _____

Slide 10 – What do you notice about the group numbers in this slide as compared to the group numbers we've discussed in class?? _____

Slide 11 – Observe the Lewis dot structures in the table. How do the number of dots around the element symbol compare to the number of valence electrons?