

Advanced Inorganic Chemistry (AICIL) - Spring 2024
Week 1 Homework - Due on Thursday of Week 1

Please answer these questions on sheets of paper (handwriting is fine). Refer to your general chemistry textbook and notes if needed. **Staple** your answer sheets and **add a cover page**. On the cover page, please write your name and "Week 1 Homework." Your homework will be collected on Thursday of Week 1 (after Week 1, homework will be assigned and due on Tuesdays).

Read Chapters 1-3 in your Inorganic chemistry textbook and take notes. You will find that you are familiar with most of the concepts covered in these chapters. If you have questions, please write them down and bring to the first inorganic chemistry lecture for a class discussion. Although you should read sections 2.2, 2.2.1 and 2.2.2, you will not be held responsible for this material.

Week 1 Homework Assignment

- Describe John Dalton's atomic theory.
- Give two examples for each of the following.
 - halogens
 - noble gases
 - alkali metals
 - alkaline earth metals
 - actinides
 - lanthanides
 - transition metals
 - coinage metals
- The principal quantum number is given the symbol _____ and determines the _____ and the _____ of an atomic orbital. It can take values _____. The angular momentum quantum number is given the symbol _____ and determines the _____ of an atomic orbital. It can take values _____. The magnetic quantum number is given the symbol _____ and determines the _____ of an atomic orbital. It can take values _____. The spin quantum number is given the symbol _____. It can take values _____.
- You need (how many) _____ quantum numbers to describe an orbital and (how many) _____ quantum numbers to describe an electron.
- Define an atomic orbital.
- Complete the following table.

| n | l | Orbital symbol |
|---|---|----------------|
| 2 | 1 | |
| 3 | 2 | |
| 4 | 3 | |

- Draw Lewis structures for the following molecules and determine their shapes. Where applicable, determine the hybridization of the central atoms.
 - SeCl₄
 - I₃⁻
 - N₃⁻
 - TeF₄²⁻
 - BH₄⁻
 - SOCl₂
 - POCl₃