

Organic Chemistry, 7e (Smith)
Chapter 1 Structure and Bonding

1) What is the ground-state electronic configuration of a carbon atom?

- A) $1s^2, 2s^2, 2p^5$
- B) $1s^2, 2s^2, 2p^2$
- C) $1s^2, 2s^2, 2p^6$
- D) $1s^2, 2s^2, 2p^4$

Answer: B

Difficulty: 1 Easy

Section: 01.01

Topic: Structure and Bonding

Bloom's: 2. Understand

Chapter: 01

Accessibility: Keyboard Navigation

2) What is the ground-state electronic configuration of a fluorine atom?

- A) $1s^2, 2s^2, 2p^2$
- B) $1s^2, 2s^2, 2p^3$
- C) $1s^2, 2s^2, 2p^4$
- D) $1s^2, 2s^2, 2p^5$

Answer: D

Difficulty: 1 Easy

Section: 01.01

Topic: Structure and Bonding

Bloom's: 2. Understand

Chapter: 01

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3) What is the ground-state electronic configuration of a magnesium cation (Mg^{2+})?

- A) $1s^2, 2s^2, 2p^6$
- B) $1s^2, 2s^2, 2p^6, 3s^1$
- C) $1s^2, 2s^2, 2p^6, 3s^2$
- D) $1s^2, 2s^2, 2p^6, 3s^2, 3p^2$

Answer: A

Difficulty: 1 Easy

Section: 01.01

Topic: Structure and Bonding

Bloom's: 2. Understand

Chapter: 01

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4) What is the ground-state electronic configuration of a chlorine anion (Cl^-)?

- A) $1s^2, 2s^2, 2p^6$
- B) $1s^2, 2s^2, 2p^6, 3s^2, 3p^6$
- C) $1s^2, 2s^2, 2p^6, 3s^2, 3p^5$
- D) $1s^2, 2s^2, 2p^6, 3s^2, 3p^4$

Answer: B

Difficulty: 1 Easy

Section: 01.01

Topic: Structure and Bonding

Bloom's: 2. Understand

Chapter: 01

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5) Which of the following statements about valence electrons is true?

- A) They are the most tightly held electrons.
- B) They do not participate in chemical reactions.
- C) They are the outermost electrons.
- D) They reveal the period number of a second-row element.

Answer: C

Difficulty: 1 Easy

Section: 01.01

Topic: Structure and Bonding

Bloom's: 2. Understand

Chapter: 01

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6) Which of the following atoms will have a full 3s orbital in the ground state?

- A) Hydrogen
- B) Lithium
- C) Potassium
- D) Rubidium

Answer: D

Difficulty: 2 Medium

Section: 01.01

Topic: Structure and Bonding

Bloom's: 2. Understand

Chapter: 01

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- 7) Which of the following statements about bonding is true?
- A) Covalent bonds result from the transfer of electrons from one element to another.
 - B) Ionic bonds result from the transfer of electrons from a metal to a non-metal.
 - C) Ionic bonds result from the sharing of electrons between two non-metals.
 - D) Covalent bonds result from the sharing of electrons between two metals.

Answer: B

Difficulty: 1 Easy

Section: 01.02

Topic: Structure and Bonding

Bloom's: 1. Remember

Chapter: 01

Accessibility: Keyboard Navigation

- 8) Which of the following would you expect to have ionic bonds?
- A) CO
 - B) FBr
 - C) NF₃
 - D) NaCl

Answer: D

Difficulty: 1 Easy

Section: 01.02

Topic: Structure and Bonding

Bloom's: 3. Apply

Chapter: 01

Accessibility: Keyboard Navigation

- 9) Which of the following molecules has nonpolar covalent bonds?
- A) HCl
 - B) N₂
 - C) CHCl₃
 - D) NO

Answer: B

Difficulty: 1 Easy

Section: 01.02

Topic: Structure and Bonding

Bloom's: 2. Understand

Chapter: 01

Accessibility: Keyboard Navigation

10) Which of the following molecules contain both covalent and ionic bonds?

NaCl	NH ₄ OH	CH ₃ OH	MgCO ₃
I	II	III	IV

- A) I, II
- B) I, IV
- C) II, III
- D) II, IV

Answer: D

Difficulty: 1 Easy

Section: 01.02

Topic: Structure and Bonding

Bloom's: 3. Apply

Chapter: 01

11) Which of the following would most likely form an ionic bond?

C-C	C-N	C-O	Na-O
I	II	III	IV

- A) I
- B) II
- C) III
- D) IV

Answer: D

Difficulty: 1 Easy

Section: 01.02

Topic: Structure and Bonding

Bloom's: 3. Apply

Chapter: 01

12) Which of the following statements correctly describes the typical number of bonds for carbon, nitrogen, and oxygen in most neutral organic molecules?

- A) Carbon forms 4 covalent bonds, nitrogen forms 2 covalent bonds, and oxygen forms 3 covalent bonds.
- B) Carbon forms 4 covalent bonds, nitrogen forms 3 covalent bonds, and oxygen forms 2 covalent bonds.
- C) Carbon forms 4 covalent bonds, nitrogen forms 5 covalent bonds, and oxygen forms 2 covalent bonds.
- D) Carbon forms 4 covalent bonds, nitrogen forms 5 covalent bonds, and oxygen forms 4 covalent bonds.

Answer: B

Difficulty: 1 Easy

Section: 01.02

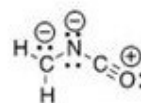
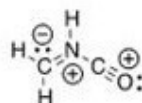
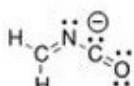
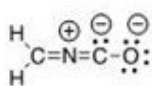
Topic: Structure and Bonding

Bloom's: 1. Remember

Chapter: 01

Accessibility: Keyboard Navigation

13) Which is not an acceptable Lewis structure for the anion CH_2NCO^- ?



- A) I
- B) II
- C) III
- D) IV

Answer: C

Difficulty: 2 Medium

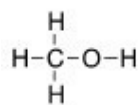
Section: 01.03

Topic: Structure and Bonding

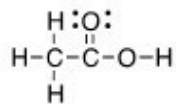
Bloom's: 4. Analyze

Chapter: 01

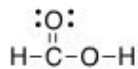
14) Which of the following Lewis structures is correct?



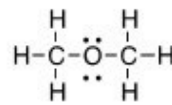
I



II



III



IV

- A) I
- B) II
- C) III
- D) IV

Answer: D

Difficulty: 2 Medium

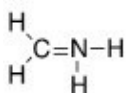
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Topic: Structure and Bonding

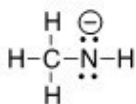
Bloom's: 4. Analyze

Chapter: 01

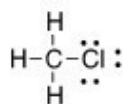
15) Which of the following Lewis structures is correct?



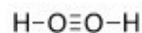
I



II



III



IV

- A) I, II
- B) I, III
- C) II, III
- D) III, IV

Answer: C

Difficulty: 2 Medium

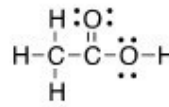
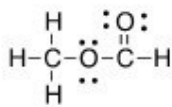
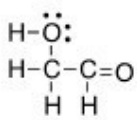
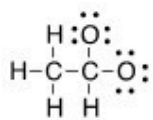
Section: 01.03

Topic: Structure and Bonding

Bloom's: 4. Analyze

Chapter: 01

16) Which is the correct Lewis structure for acetic acid ($\text{CH}_3\text{CO}_2\text{H}$)?



- A) I
- B) II
- C) III
- D) IV

Answer: D

Difficulty: 2 Medium

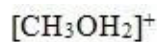
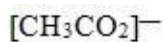
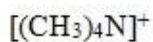
Section: 01.03

Topic: Structure and Bonding

Bloom's: 4. Analyze

Chapter: 01

17) In which of the following ions does carbon have a formal charge?



- A) I
- B) II
- C) III
- D) None of these

Answer: D

Difficulty: 1 Easy

Section: 01.03

Topic: Structure and Bonding

Bloom's: 1. Remember

Chapter: 01