

Module 4: Bonding, Formula Writing, and Nomenclature

Topic 2 Content: Lewis Dot Structures Notes

Introduction

Lewis Dot Structures

Example: Water

Example: Hydrogen Chloride

Example: Methane

Example: Ammonia

Example: Boron Trifluoride

Example: Nitrogen Gas

Example: Ozone

Introduction

•-Lewis Dot Structures-•

In this interactivity, click on each of the tabs to view examples of different Lewis dot structures.

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Example: Methane

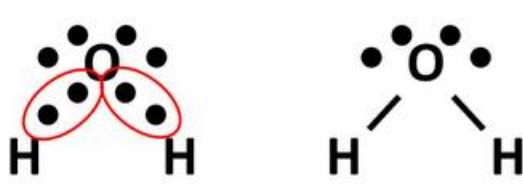
Example: Ammonia

Example: Boron Trifluoride

Example: Nitrogen Gas

Example: Ozone

Example: Water



The Lewis dot structures of water (H_2O) are shown here. Both representations are correct.

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Example: Hydrogen Chloride



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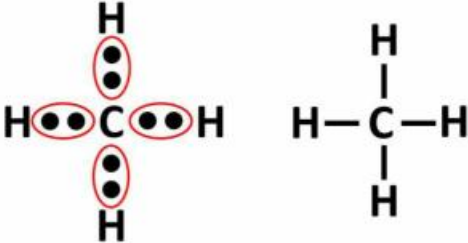
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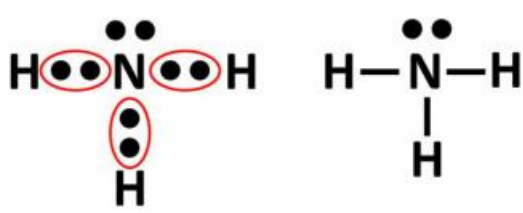
Example: Ammonia

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Example: Ammonia



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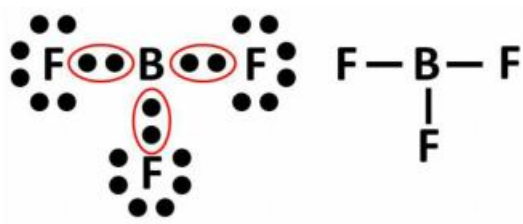
Example: Ammonia

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Example: Ozone

Example: Boron Trifluoride



The Lewis dot structures of boron trifluoride (BF_3) are shown here. Both representations are correct. According to experimental evidence, boron forms three equal bonds and only needs six electrons to be stable. This is considered an exception to the rules for Lewis dot structures, but is consistent with what is observed with boron compounds.

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Example: Nitrogen Gas



The Lewis dot structures of nitrogen gas (N_2) are shown here. Both representations are correct. As you can see from the structure, nitrogen gas forms a triple bond. A triple bond forms when six electrons are shared between two atoms instead of the usual two in covalent bonding.

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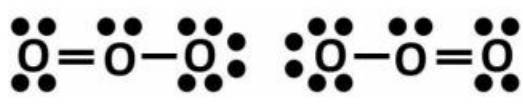
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The Lewis dot structures of ozone (O_3) are shown here. Both representations are correct. Because there is more than one valid Lewis dot structure for this molecule, it is said to exhibit resonance. This substance exhibits the characteristics of two structural forms. When compounds exhibit resonance, they are extremely stable.

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