

Lewis Structures and Formal Charge

Student Worksheet | g09_u06_w22

I can: draw simple Lewis structures, count valence electrons, calculate formal charge, and describe resonance as a model limitation.

Vocabulary: Lewis structure, lone pair, bonding pair, octet, formal charge, resonance, resonance hybrid.

1. Count valence electrons in H_2 .

2. Count valence electrons in H_2O .

3. Count valence electrons in CO_2 .

4. Draw Lewis structure for H_2 .

5. Draw Lewis structure for H_2O .

6. Draw Lewis structure for NH_3 .

7. State octet-rule exception for H.

8. Calculate formal charge: $\text{FC} = \text{valence} - \text{nonbonding} - \text{half bonding}$.

9. Find formal charge of O in H_2O .

10. Find formal charge of N in NH_4^+ .

11. Find formal charge of O in OH^- .

12. Explain why total formal charges equal overall ion charge.

13. Draw CO_2 with double bonds.

14. Why is a Lewis structure not a 3-D shape model?

15. What is resonance in nitrate, NO_3^- ?

16. Why are resonance drawings not atoms rapidly moving bonds back and forth?

17. What does a resonance hybrid communicate?

18. Compare two valid nitrate resonance contributors.

19. A student puts ten electrons around H. Diagnose octet/H-rule error.

20. Critique: "Formal charge is the measured charge on every atom."
