*A stepwise approach to perfect Lewis structures\**

**Step 1:** Arrange atoms in space based on connectivity given in molecular formula.

**Step 2:** Add single bonds to all atoms that are connected to each other.

**Step 3:** Identify all carbon atoms without a filled valence shell. For each such carbon atom, look for an adjacent atom that is also without a filled valence and connect with one or two multiple bonds.

**Step 4:** Add lone pairs to fill all remaining unfilled valence shells.

**Step 5:** Add any formal charges as identified by the table presented during the first lecture.

\*This works for all but molecules with a carbocation. Do not worry about those at this time.

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*Valence Electrons in Neutral Atoms*:

H C N O F,Cl,Br,I

1 4 5 6 7

*Formal Charge Identification:*

Neutral Positive Charge Negative Charge

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Atom | # electrons in the valence shell | Bonds | Lone  Pairs | Bonds | Lone  Pairs | Bonds | Lone Pairs |
| H | 2 | 1 | 0 | 0 | 0 | 0 | 1 (rare) |
| C | 8 | 4 | 0 | 3 | 0 | 3 | 1 |
| N | 8 | 3 | 1 | 4 | 0 | 2 | 2 |
| O | 8 | 2 | 2 | 3 | 1 | 1 | 3 |
| F,Cl,Br,I | 8 | 1 | 3 | - | - | 0 | 4 |