

Chemistry 20 – Lesson 9
Lewis diagrams

/42

Part A

Atom	# Valence e ⁻	# Orbitals	Lewis Diagram	# Lone pairs	# Bonding e ⁻
S	6	4		2	2
Si	4	4		0	4
P	5	4		1	3
Cl	7	4		3	1
Br	7	4		3	1
Be	2	4		0	2

Part B

Molecular Substance	Molecular Formula	Lewis Diagrams of each atom	Lewis diagram of Molecule	Structural diagram
chloroform	CHCl ₃	$\cdot \overset{\cdot}{\underset{\cdot}{\text{C}}} \cdot$ $\overset{\cdot}{\underset{\cdot}{\text{Cl}}} \cdot$ $\overset{\cdot}{\text{H}}$	$\begin{array}{c} \overset{\cdot}{\text{F}} \\ \cdot \\ \overset{\cdot}{\text{F}} : \overset{\cdot}{\text{C}} : \overset{\cdot}{\text{F}} \\ \cdot \\ \text{H} \end{array}$	$\begin{array}{c} \text{H} \\ \\ \text{H}-\text{C}-\text{Cl} \\ \\ \text{H} \end{array}$
ammonia	NH ₃	$\overset{\cdot\cdot}{\underset{\cdot}{\text{N}}} \cdot$ $\overset{\cdot}{\text{H}}$	$\text{H} : \overset{\cdot\cdot}{\underset{\cdot}{\text{N}}} : \text{H}$ H	$\begin{array}{c} \text{H}-\text{N}-\text{H} \\ \\ \text{H} \end{array}$
water	H ₂ O	$\overset{\cdot\cdot}{\underset{\cdot}{\text{O}}} \cdot$ $\overset{\cdot}{\text{H}}$	$\overset{\cdot\cdot}{\underset{\cdot}{\text{O}}} : \text{H}$ H	$\begin{array}{c} \text{O}-\text{H} \\ \\ \text{H} \end{array}$
bromine	Br ₂	$\overset{\cdot\cdot}{\underset{\cdot\cdot}{\text{Br}}} \cdot$	$\overset{\cdot\cdot}{\underset{\cdot\cdot}{\text{Br}}} : \overset{\cdot\cdot}{\underset{\cdot\cdot}{\text{Br}}}$	$\text{Br}-\text{Br}$
oxygen difluoride	OF ₂	$\overset{\cdot\cdot}{\underset{\cdot}{\text{O}}} \cdot$ $\overset{\cdot\cdot}{\underset{\cdot}{\text{F}}} \cdot$	$\overset{\cdot\cdot}{\underset{\cdot}{\text{O}}} : \overset{\cdot\cdot}{\underset{\cdot}{\text{F}}}$ $\overset{\cdot\cdot}{\underset{\cdot}{\text{F}}}$	$\begin{array}{c} \text{O}-\text{F} \\ \\ \text{F} \end{array}$
fluoromethane	CH ₃ F	$\cdot \overset{\cdot}{\underset{\cdot}{\text{C}}} \cdot$ $\overset{\cdot}{\text{H}}$ $\overset{\cdot\cdot}{\underset{\cdot\cdot}{\text{F}}} \cdot$	$\begin{array}{c} \text{H} \\ \cdot \\ \text{H} : \overset{\cdot}{\underset{\cdot}{\text{C}}} : \overset{\cdot\cdot}{\underset{\cdot\cdot}{\text{F}}} \\ \cdot \\ \text{H} \end{array}$	$\begin{array}{c} \text{H} \\ \\ \text{H}-\text{C}-\text{F} \\ \\ \text{H} \end{array}$
chlorine	Cl ₂	$\overset{\cdot\cdot}{\underset{\cdot\cdot}{\text{Cl}}} \cdot$	$\overset{\cdot\cdot}{\underset{\cdot\cdot}{\text{Cl}}} : \overset{\cdot\cdot}{\underset{\cdot\cdot}{\text{Cl}}}$	$\text{Cl}-\text{Cl}$
nitrogen triiodide	NI ₃	$\overset{\cdot\cdot}{\underset{\cdot}{\text{N}}} \cdot$ $\overset{\cdot\cdot}{\underset{\cdot\cdot}{\text{I}}} \cdot$	$\overset{\cdot\cdot}{\underset{\cdot\cdot}{\text{I}}} : \overset{\cdot\cdot}{\underset{\cdot\cdot}{\text{N}}} : \overset{\cdot\cdot}{\underset{\cdot\cdot}{\text{I}}}$ $\overset{\cdot\cdot}{\underset{\cdot\cdot}{\text{I}}}$	$\begin{array}{c} \text{I}-\text{N}-\text{I} \\ \\ \text{I} \end{array}$
carbon tetrafluoride	CF ₄	$\cdot \overset{\cdot}{\underset{\cdot}{\text{C}}} \cdot$ $\overset{\cdot\cdot}{\underset{\cdot\cdot}{\text{F}}} \cdot$	$\begin{array}{c} \overset{\cdot\cdot}{\text{F}} \\ \cdot \\ \overset{\cdot\cdot}{\text{F}} : \overset{\cdot}{\underset{\cdot}{\text{C}}} : \overset{\cdot\cdot}{\text{F}} \\ \cdot \\ \overset{\cdot\cdot}{\text{F}} \end{array}$	$\begin{array}{c} \text{F} \\ \\ \text{F}-\text{C}-\text{F} \\ \\ \text{F} \end{array}$
dibromo-chloromethane	CHBr ₂ Cl	$\cdot \overset{\cdot}{\underset{\cdot}{\text{C}}} \cdot$ $\overset{\cdot}{\text{H}}$ $\overset{\cdot\cdot}{\underset{\cdot\cdot}{\text{Br}}} \cdot$ $\overset{\cdot\cdot}{\underset{\cdot\cdot}{\text{Cl}}} \cdot$	$\overset{\cdot\cdot}{\underset{\cdot\cdot}{\text{Cl}}} : \overset{\cdot}{\underset{\cdot}{\text{C}}} : \overset{\cdot\cdot}{\underset{\cdot\cdot}{\text{Br}}}$ $\overset{\cdot\cdot}{\underset{\cdot\cdot}{\text{Br}}}$	$\begin{array}{c} \text{H} \\ \\ \text{Cl}-\text{C}-\text{Br} \\ \\ \text{Br} \end{array}$

silicon tetrafluoride	SiF ₄	$\cdot\overset{\cdot}{\text{Si}}\cdot \quad \cdot\overset{\cdot}{\text{F}}\cdot$	$\begin{array}{c} \cdot\overset{\cdot}{\text{F}}\cdot \\ \cdot\overset{\cdot}{\text{F}}\cdot\overset{\cdot}{\text{Si}}\cdot\overset{\cdot}{\text{F}}\cdot \\ \cdot\overset{\cdot}{\text{F}}\cdot \end{array}$	$\begin{array}{c} \text{F} \\ \\ \text{F}-\text{Si}-\text{F} \\ \\ \text{F} \end{array}$
hydrogen chloride	HCl	$\overset{\cdot}{\text{H}} \quad \cdot\overset{\cdot}{\text{Cl}}\cdot$	$\cdot\overset{\cdot}{\text{Cl}}\cdot\overset{\cdot}{\text{H}}$	$\text{Cl}-\text{H}$
methanol	CH ₃ OH	$\cdot\overset{\cdot}{\text{C}}\cdot \quad \cdot\overset{\cdot}{\text{O}}\cdot \quad \overset{\cdot}{\text{H}}$	$\begin{array}{c} \text{H} \quad \text{H} \\ \quad \\ \text{H}:\text{C}:\text{O}: \\ \quad \cdot \\ \text{H} \end{array}$	$\begin{array}{c} \text{H} \quad \text{H} \\ \quad \\ \text{H}-\text{C}-\text{O} \\ \\ \text{H} \end{array}$
ethanol	C ₂ H ₅ OH	$\cdot\overset{\cdot}{\text{C}}\cdot \quad \cdot\overset{\cdot}{\text{O}}\cdot \quad \overset{\cdot}{\text{H}}$	$\begin{array}{c} \text{H} \quad \text{H} \quad \text{H} \\ \quad \quad \\ \text{H}:\text{C}:\text{C}:\text{O}: \\ \quad \quad \cdot \\ \text{H} \quad \text{H} \end{array}$	$\begin{array}{c} \text{H} \quad \text{H} \quad \text{H} \\ \quad \quad \\ \text{H}-\text{C}-\text{C}-\text{O} \\ \quad \\ \text{H} \quad \text{H} \end{array}$
hydroxide	OH ⁻	$\cdot\overset{\cdot}{\text{O}}\cdot \quad \overset{\cdot}{\text{H}}$	$\cdot\overset{\cdot}{\text{O}}\cdot\overset{\cdot}{\text{H}}^-$	$\text{O}-\text{H}^-$