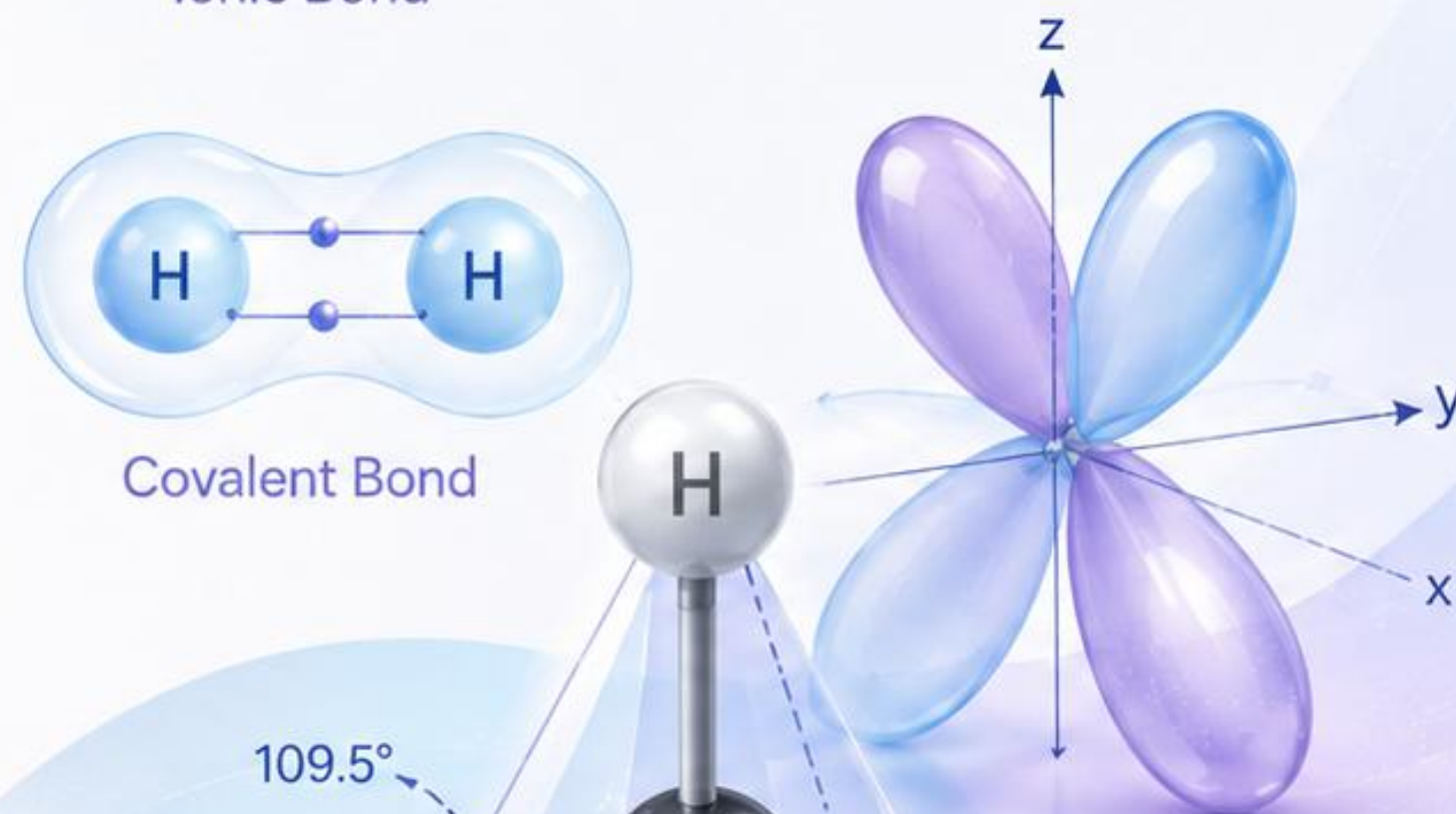


The diagram illustrates two types of chemical bonding. On the left, an ionic bond is shown between a sodium ion (Na^+) and a chloride ion (Cl^-). The sodium ion is represented by a purple sphere with the text Na^+ , and the chloride ion is a larger blue sphere with the text Cl^- . They are connected by a dashed line, indicating the electrostatic attraction. On the right, a covalent bond is shown between two atoms, each represented by a sphere (one purple, one blue) with overlapping electron shells, indicating the sharing of electrons. The background features faint molecular structures, including a benzene ring and a water molecule.

Ionic Bond

Covalent Bond

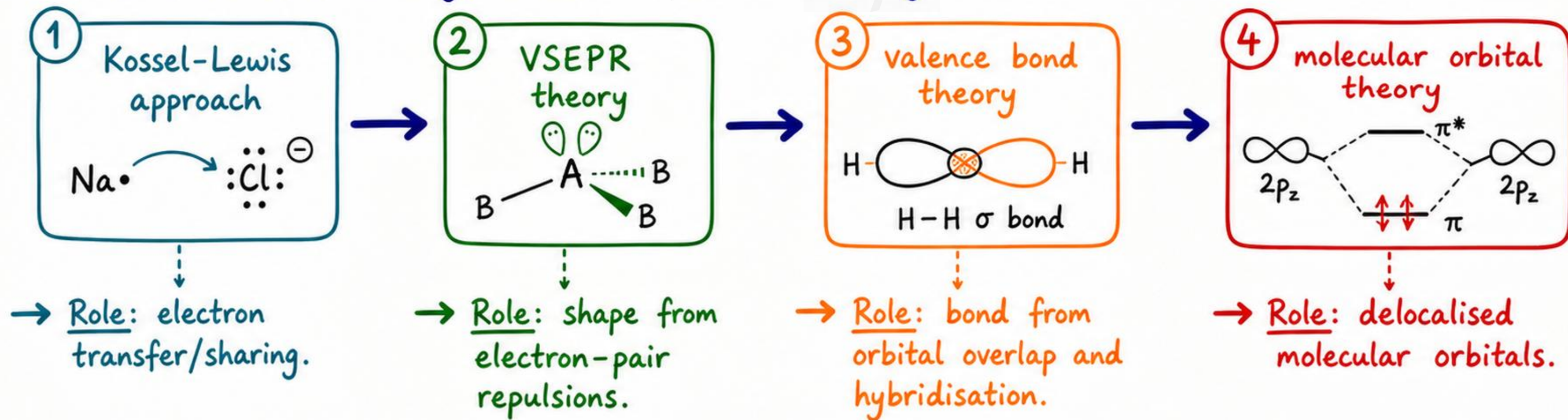


A decorative header featuring a periodic table of elements in the background. The word "Structure" is written in a large, dark blue, serif font at the top center. Below it, a rounded rectangular box contains a purple flask icon on the left and the text "Chemistry Notes | Class 11" in a dark blue, sans-serif font. The periodic table elements are shown in a light blue and white color scheme.

Chemistry Notes | Class 11

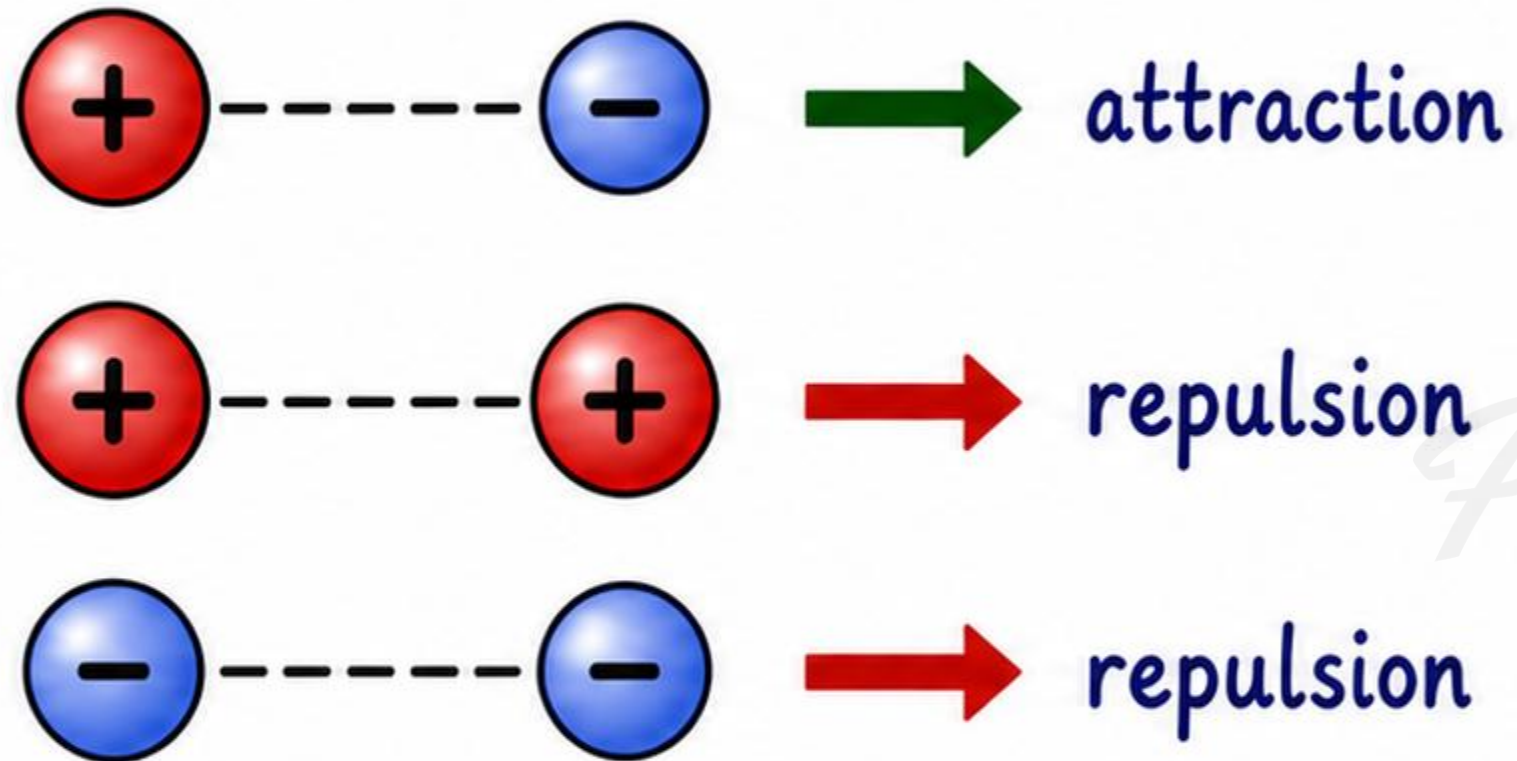
CHEMICAL BONDING: SCOPE AND ROADMAP

- A chemical bond is the attractive force that holds atoms, ions or other constituents together in a chemical species.
- A molecule is a group of atoms that exists together as one species and has characteristic properties.
- Bond formation usually lowers the energy of a system and gives greater stability.
- Four approaches used in this chapter: Kossel-Lewis approach, VSEPR theory, valence bond theory, molecular orbital theory.



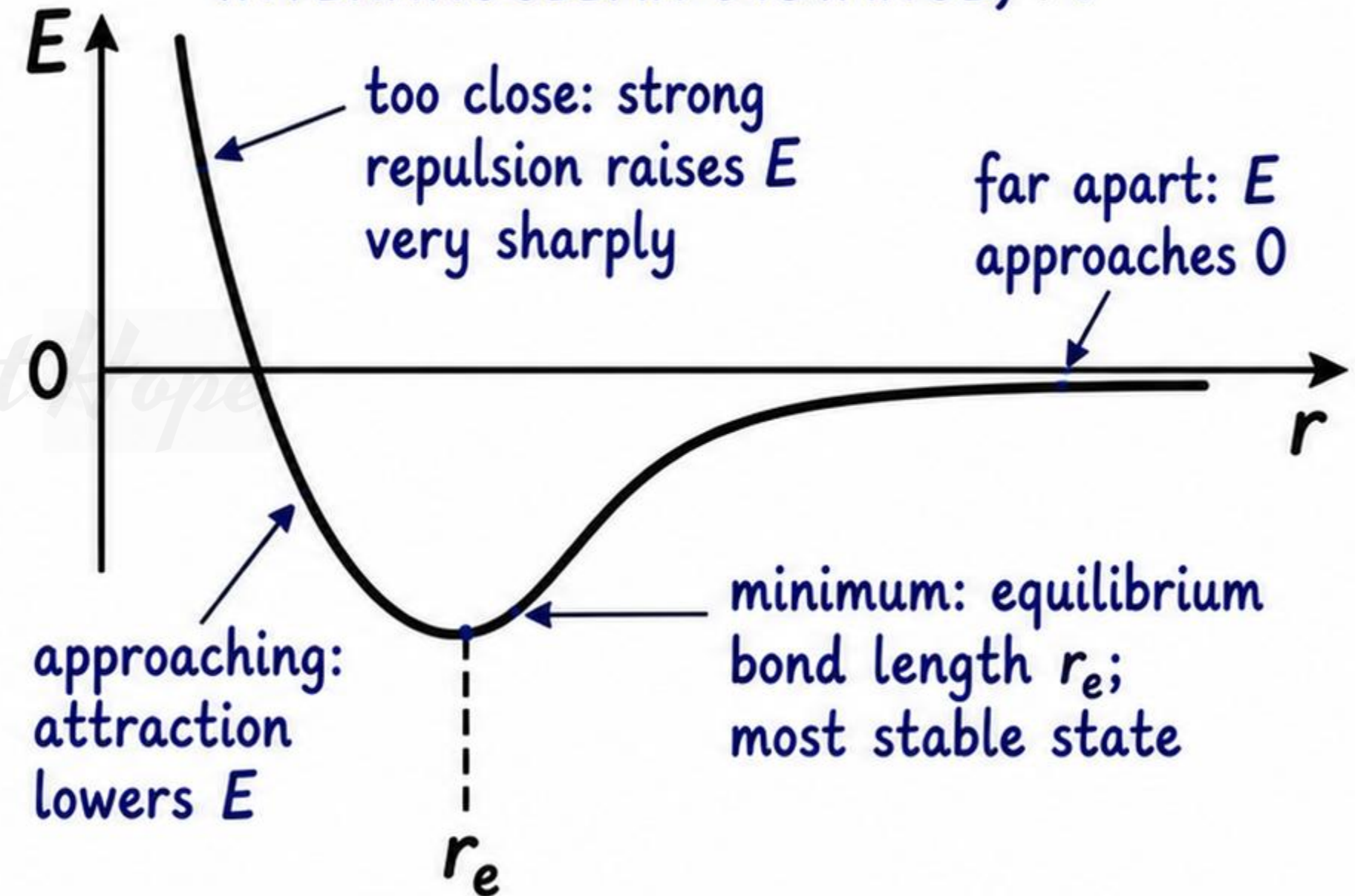
FORCES AND THE POTENTIAL-ENERGY CURVE

FORCES BETWEEN TWO ATOMS:



A stable bond needs a balance of attractions and repulsions.

POTENTIAL ENERGY, E , VERSUS INTERNUCLEAR DISTANCE, r :



★ At r_e , attractive and repulsive forces balance.

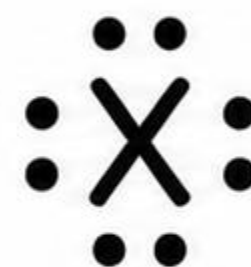
VALENCE-SHELL STABILITY AND BOND ROUTES

STABLE OUTER-SHELL ARRANGEMENTS:

- ★ Hydrogen becomes stable when 2 electrons occupy its valence shell: a duplet.



- ★ Many main-group atoms become stable with 8 valence electrons: an octet.



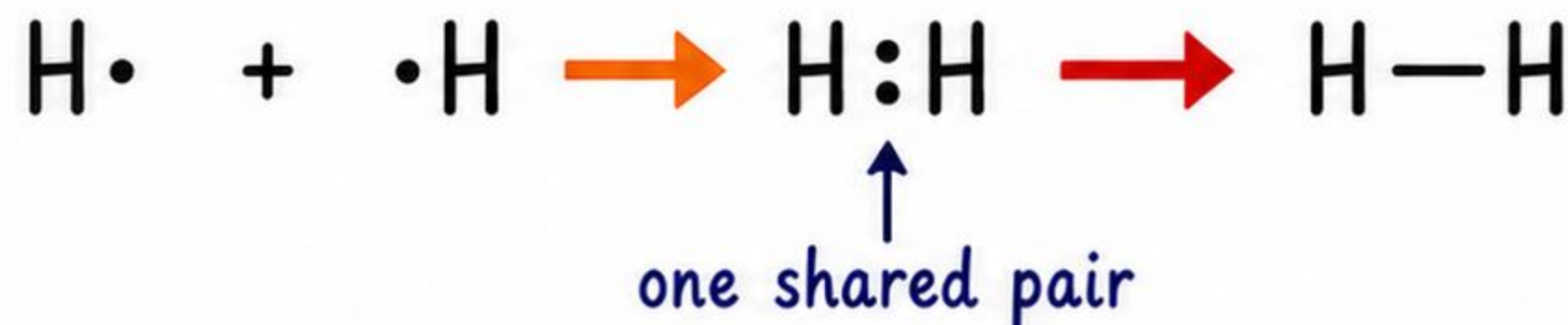
ROUTE 1 — ELECTRON TRANSFER

One atom loses electron(s);
another gains them.



ROUTE 2 — ELECTRON SHARING

Atoms share one or more pairs of electrons.



★ The octet idea is useful, but important exceptions exist.

LEWIS SYMBOLS – SECOND PERIOD

Valence electrons are the electrons in the outermost shell.

They take part in chemical bonding.

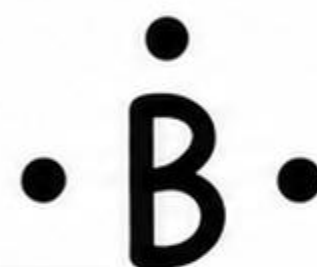
Lewis symbol = element symbol surrounded by dots representing valence electrons.



1 e^-



2 e^-



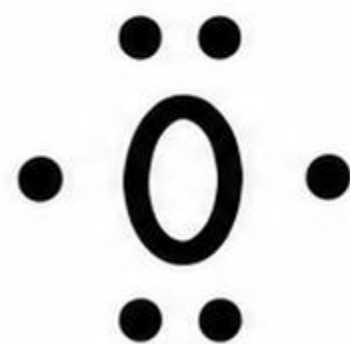
3 e^-



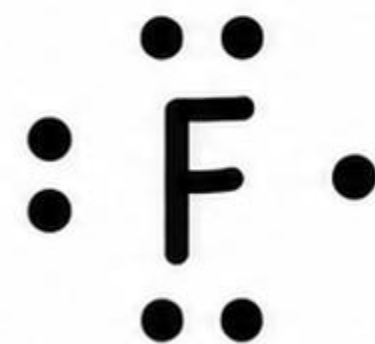
4 e^-



5 e^-



6 e^-



7 e^-



8 e^-



Number of Lewis dots = number of valence electrons.



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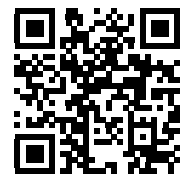


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