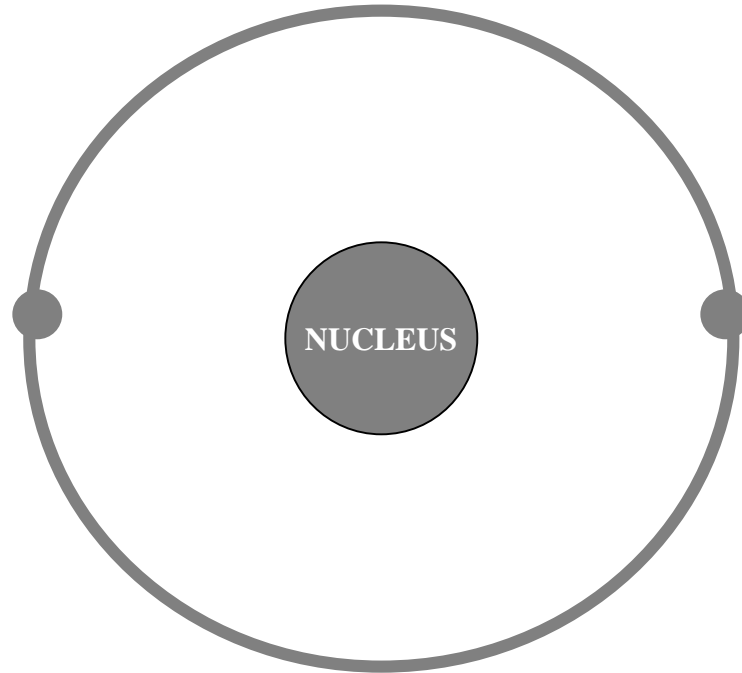


ATOM

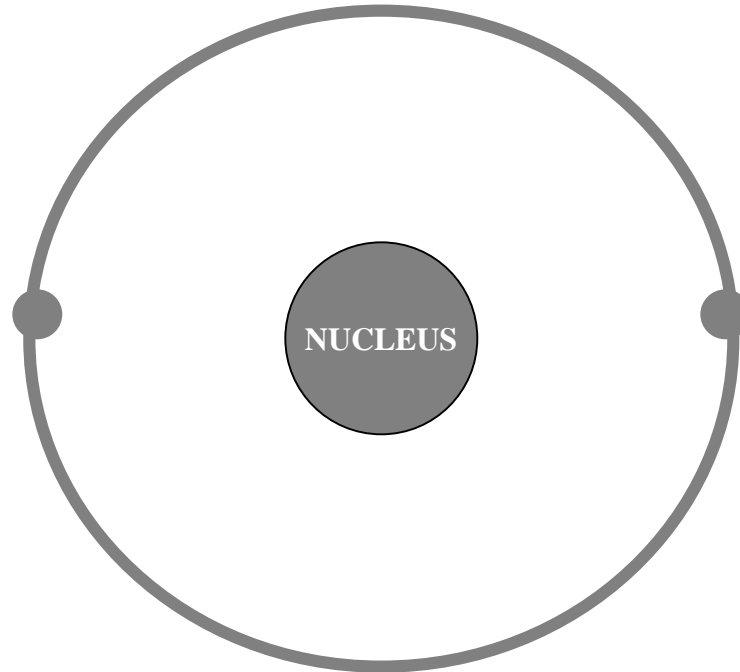


- CHARGE

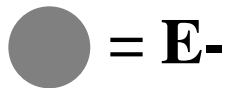
● = e-



ANION

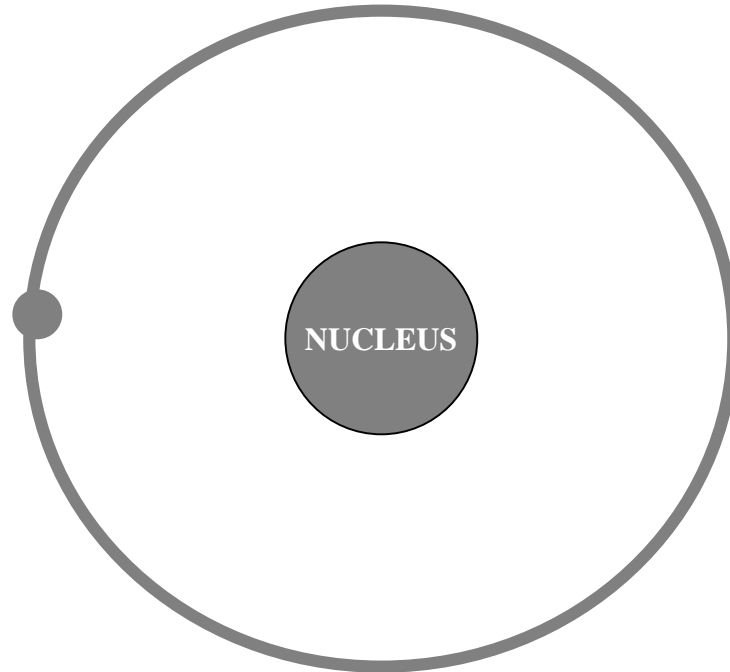


- CHARGE



CATION VS ANION SUMMARY

CATION

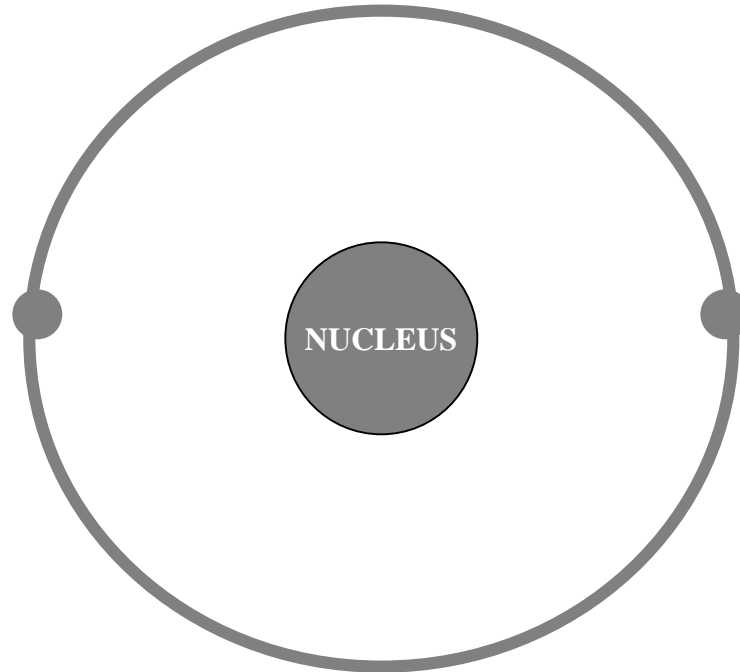


+ CHARGE

● = e-



ANION



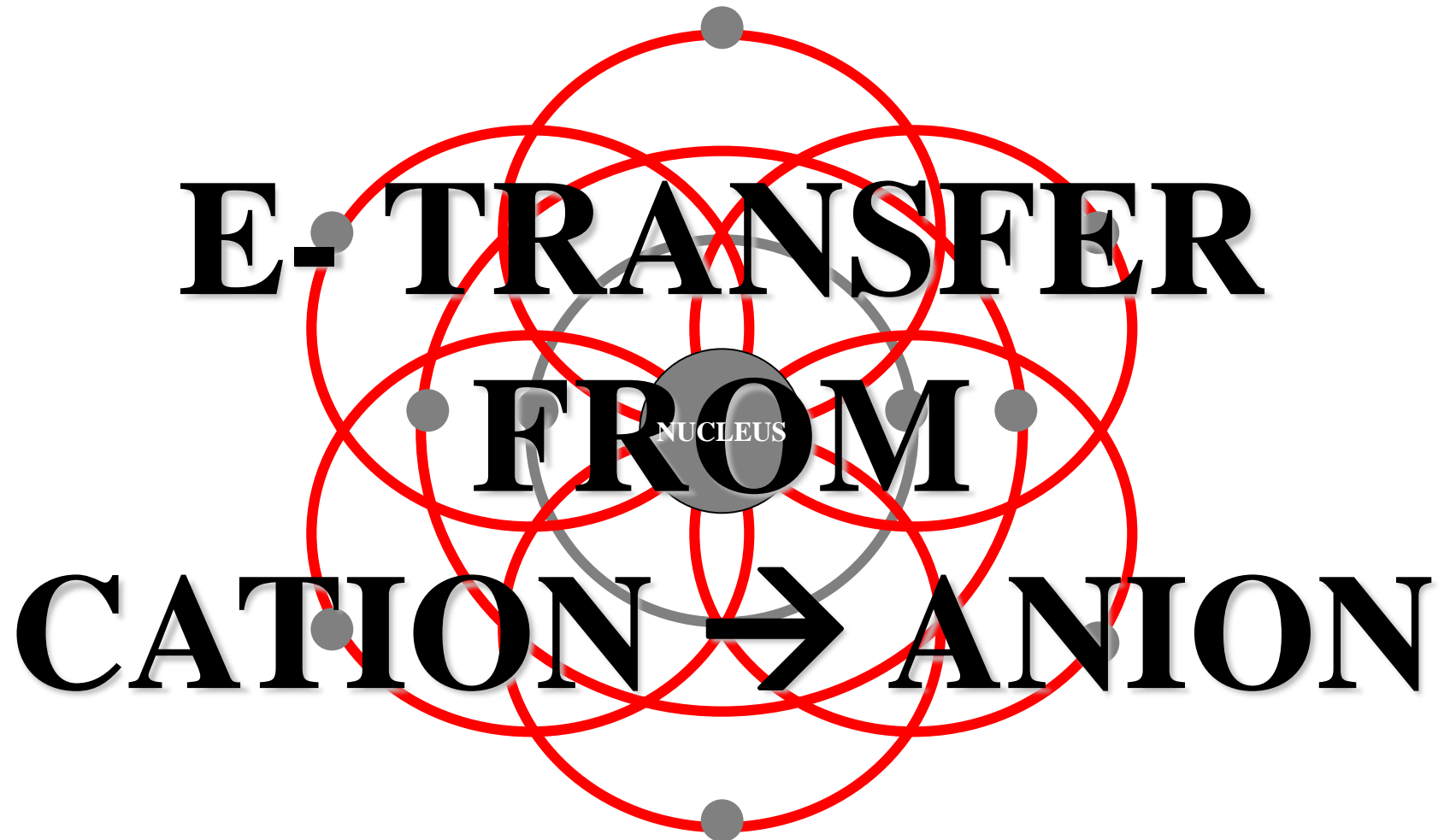
- CHARGE

● = e⁻

IONIC BOND

IONIC BOND

IONIC BOND



IONIC BOND



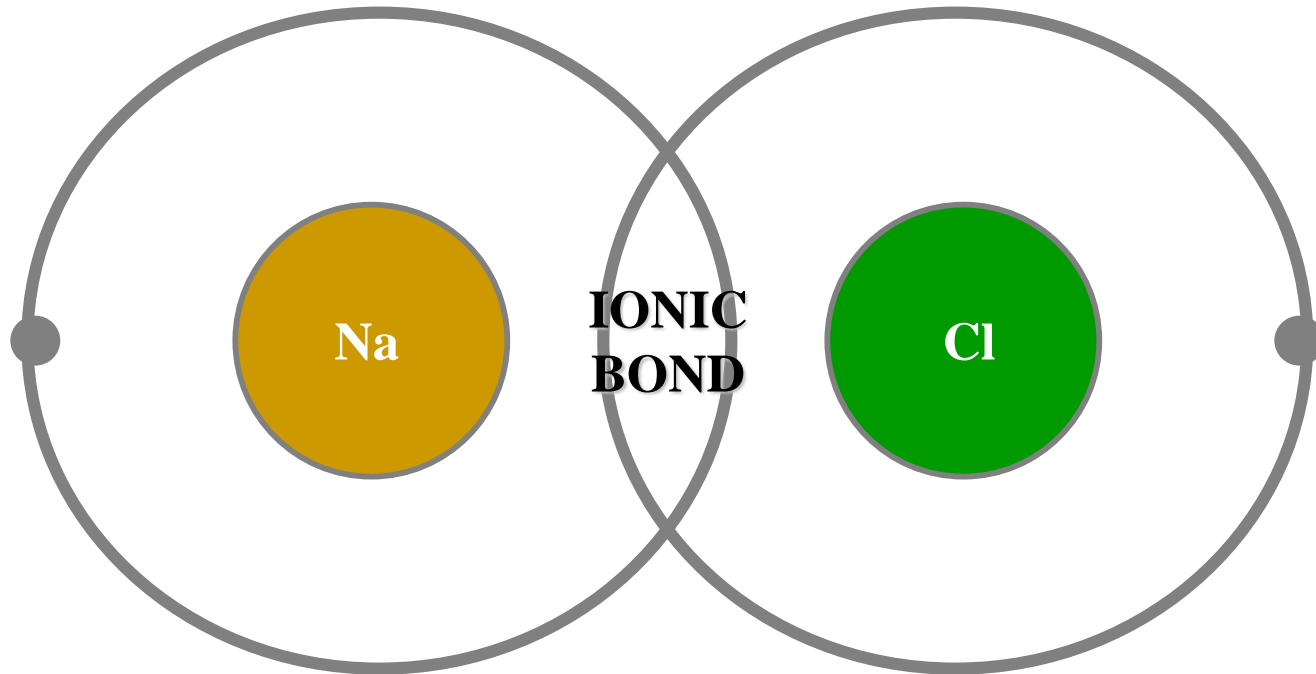
IONIC BOND

EXAMPLE

SODIUM CHLORIDE

IONIC BOND

NaCl



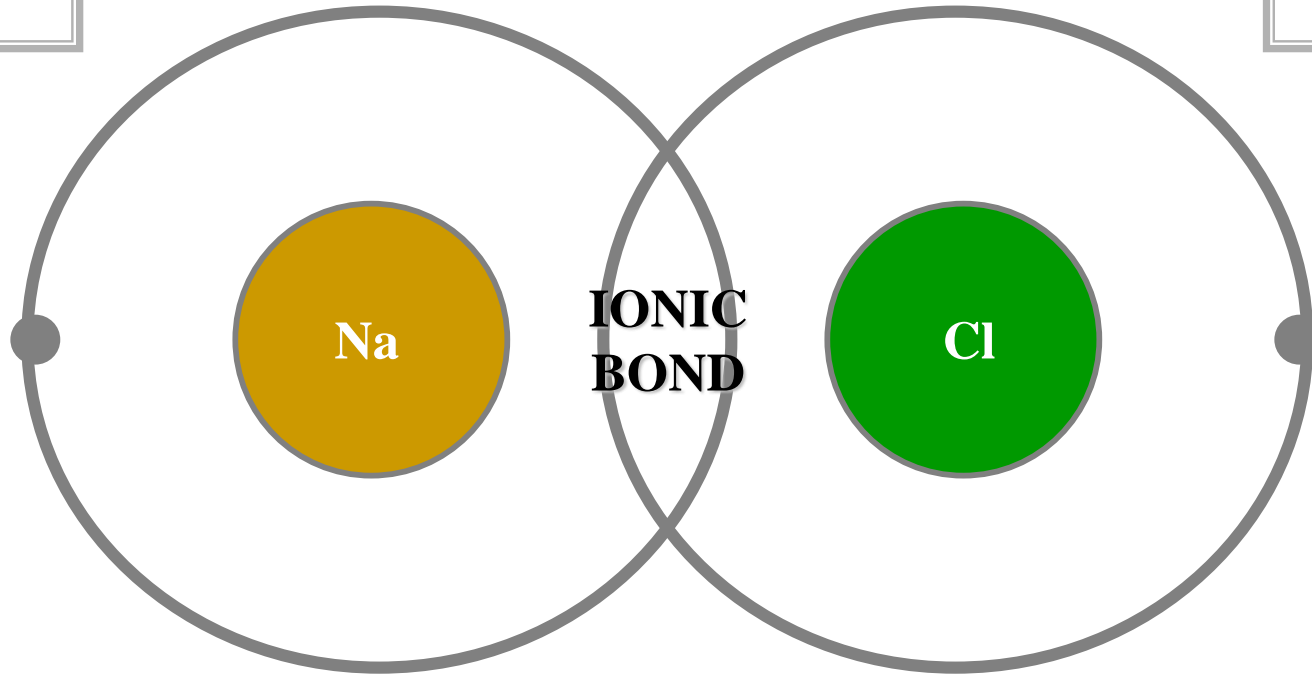
SODIUM

CHLORIDE

● = e⁻

IONIC BOND

NaCl = TABLE SALT



S

E-

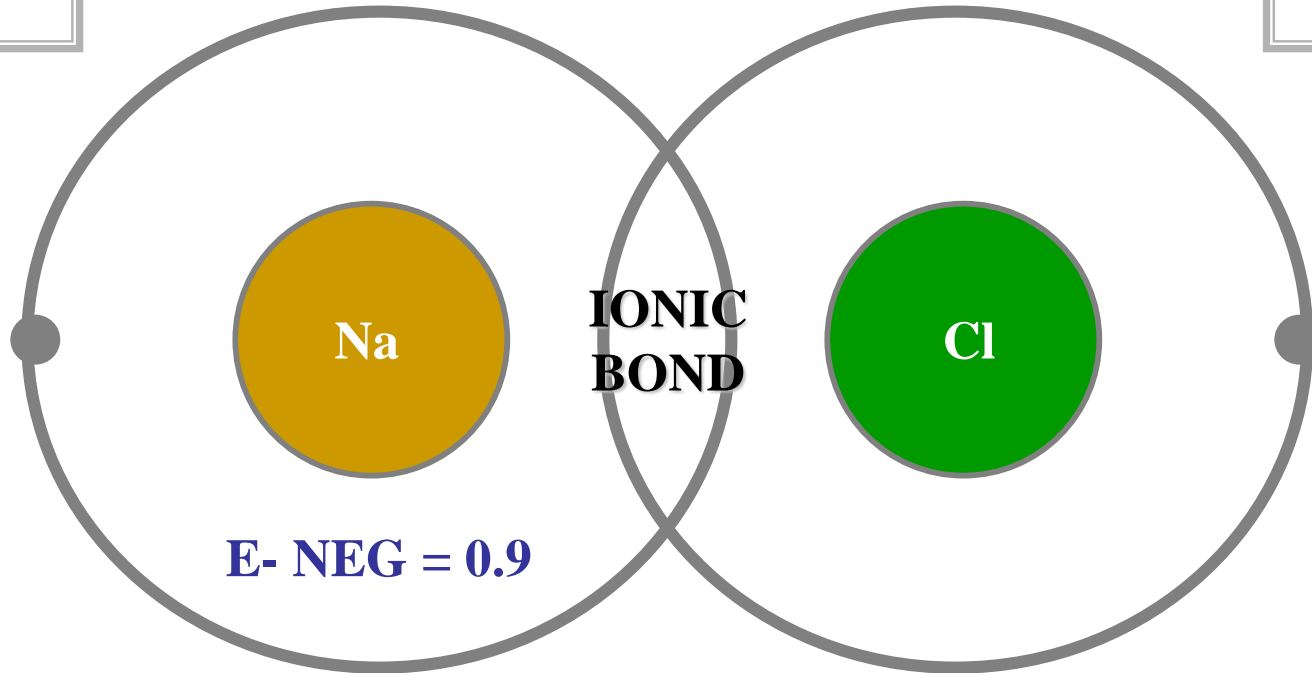
SODIUM

CHLORIDE

● = E-

IONIC BOND

NaCl = TABLE SALT



SODIUM

CHLORIDE

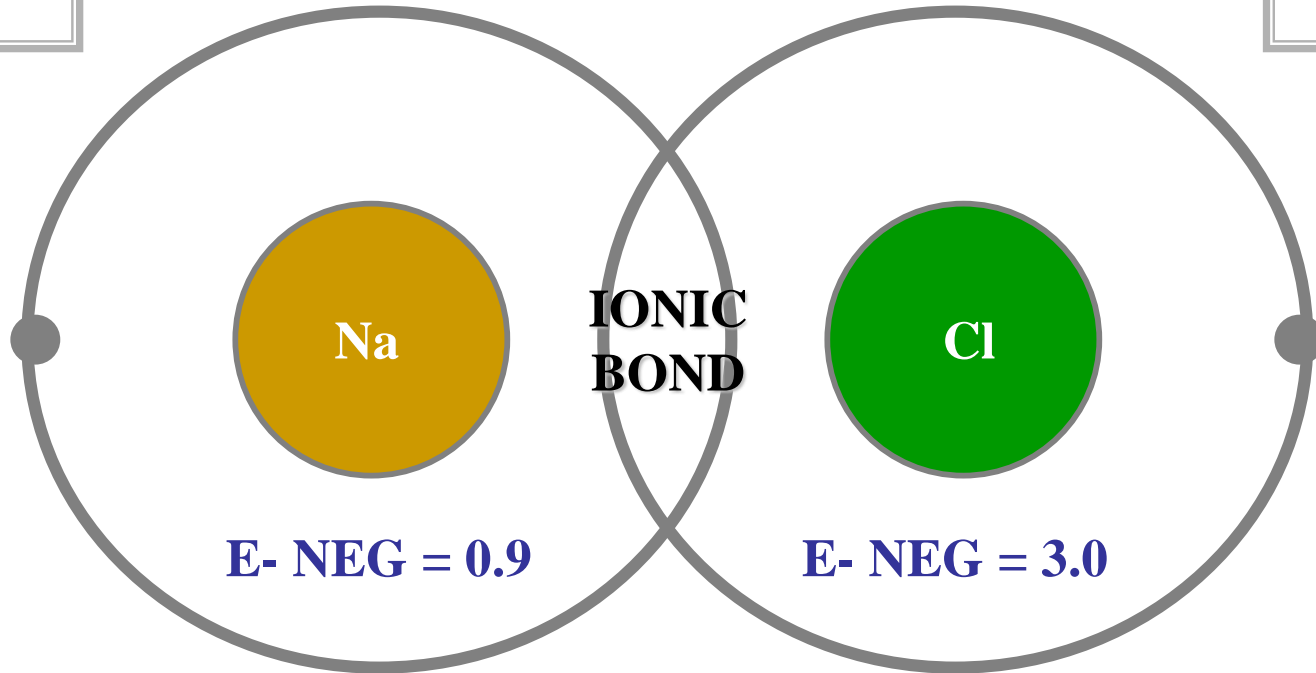
C

E-

● = E-

IONIC BOND

NaCl = TABLE SALT



SODIUM

CHLORIDE

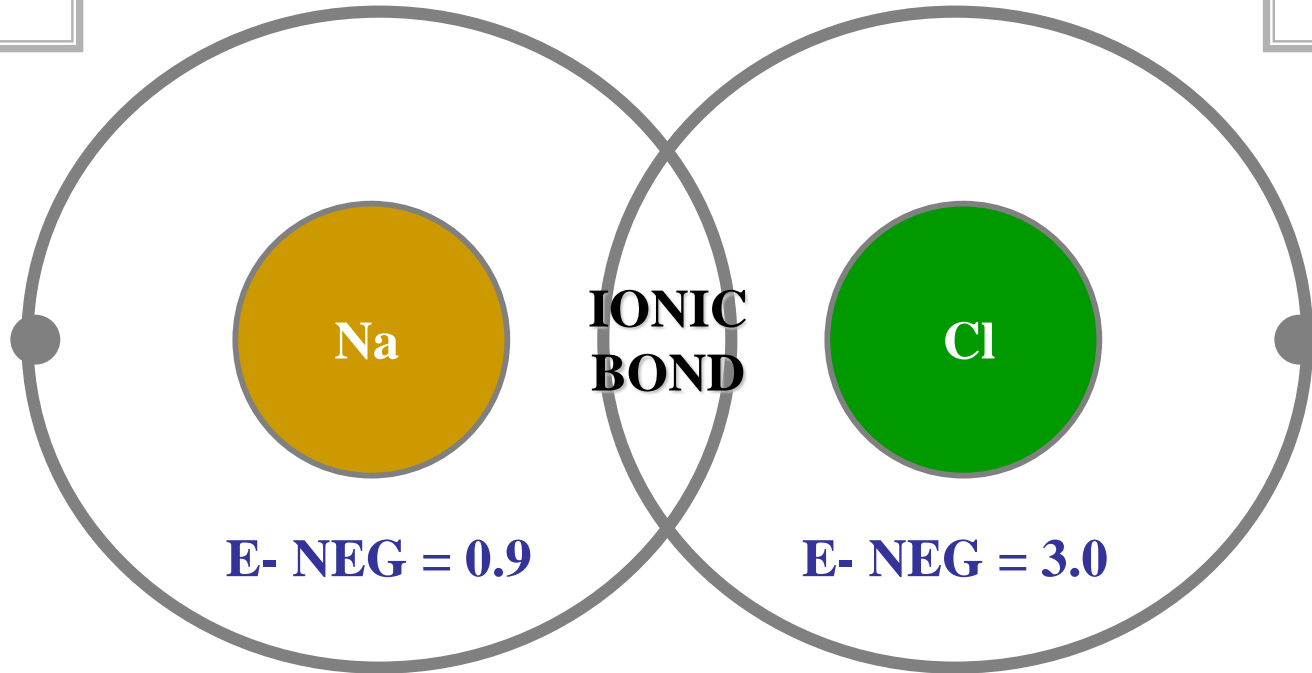
S

L

● = E-

IONIC BOND

NaCl = TABLE SALT



SODIUM

CHLORIDE

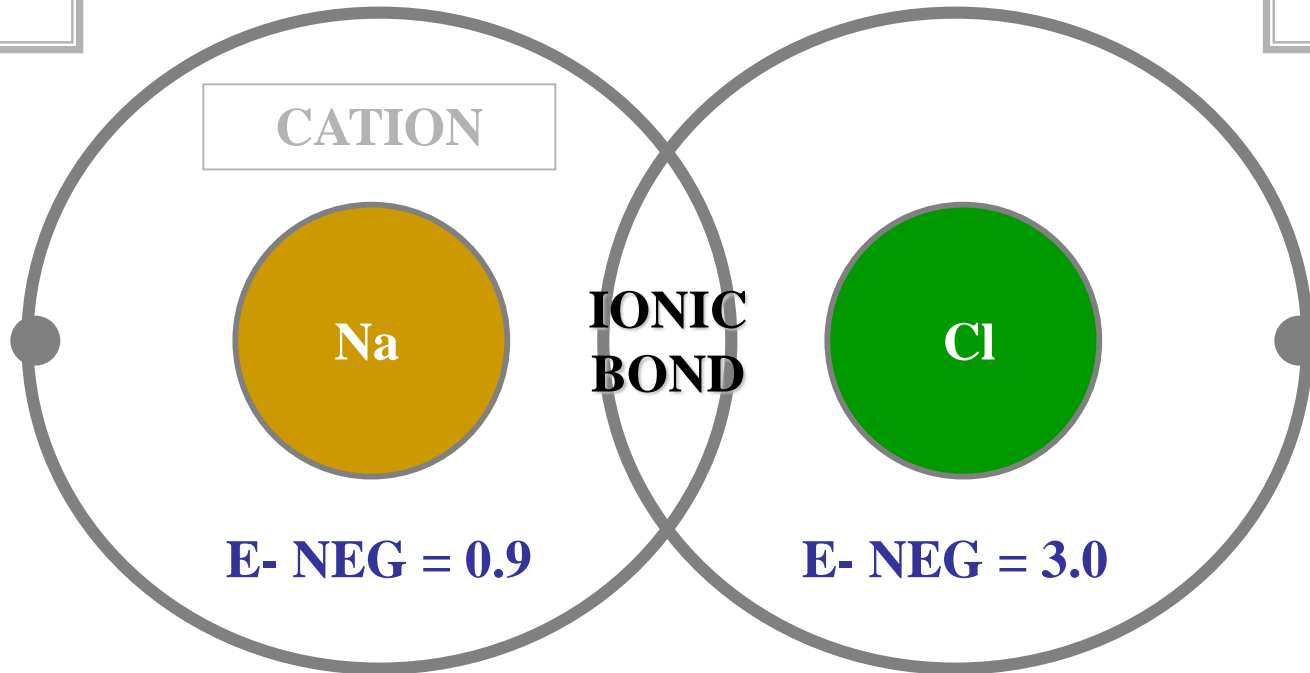
● = E-

Na LOW ELECTRO-

S
i
C

IONIC BOND

NaCl = TABLE SALT



C

H

SODIUM

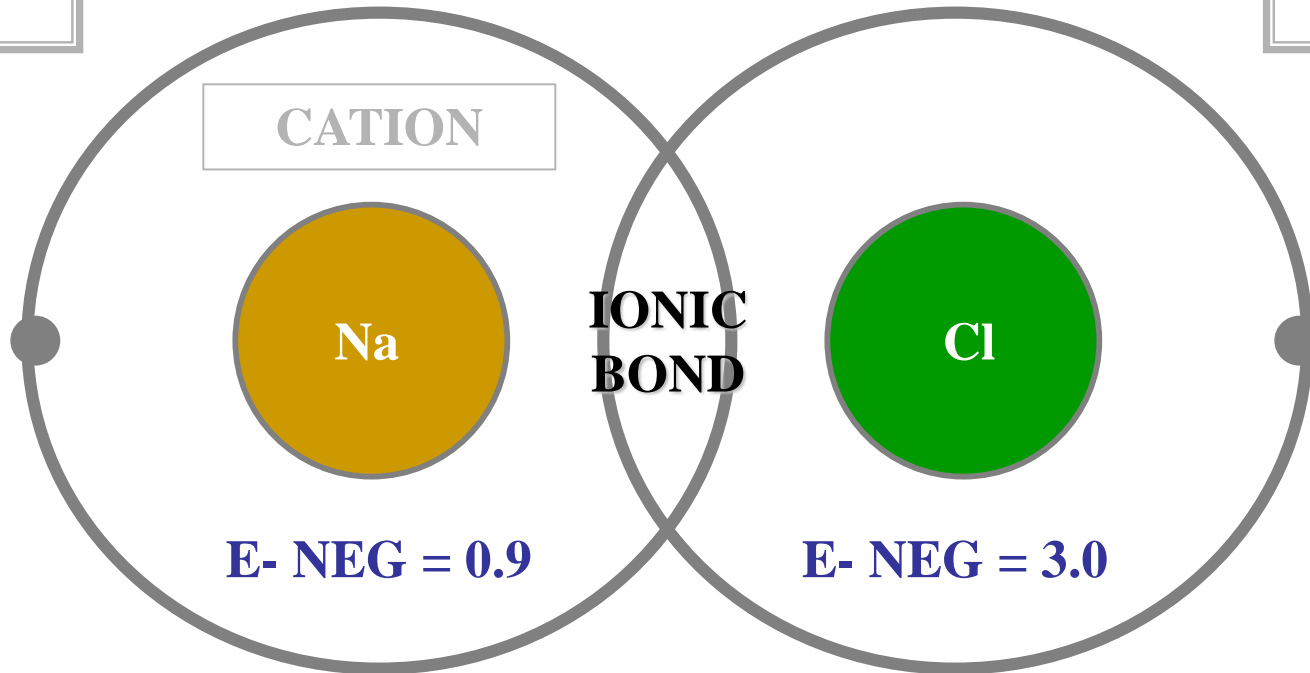
CHLORIDE

● = E-

Na LOW ELECTRO-

IONIC BOND

NaCl = TABLE SALT



C

A

SODIUM

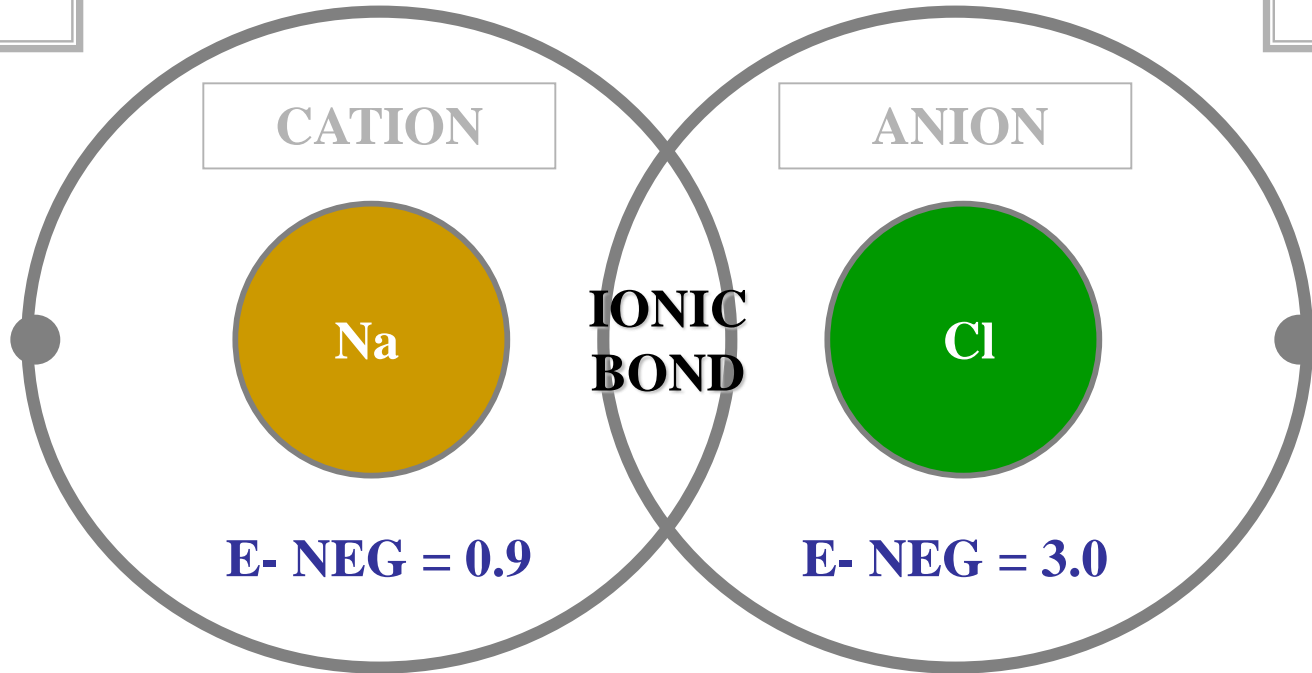
CHLORIDE

● = E-

Cl HIGH ELECTRO-

IONIC BOND

NaCl = TABLE SALT



SODIUM

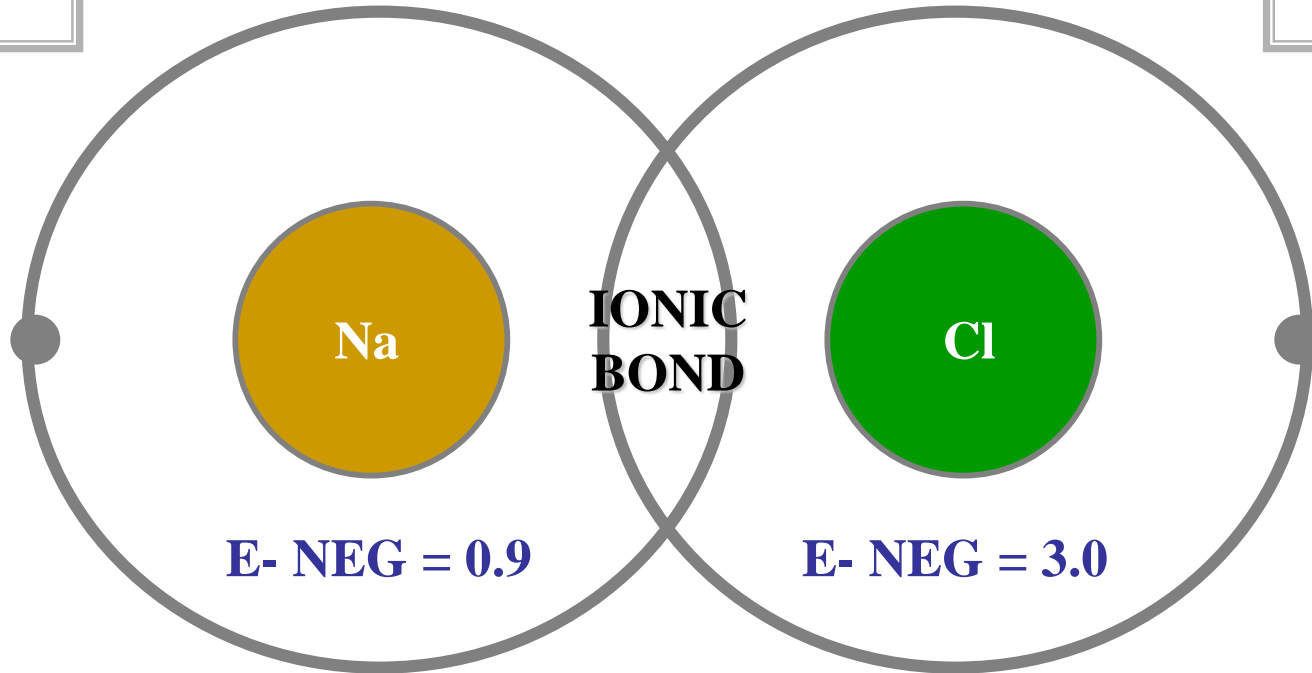
CHLORIDE

Cl HIGH ELECTRO-

● = E-

IONIC BOND

NaCl = TABLE SALT



E- T

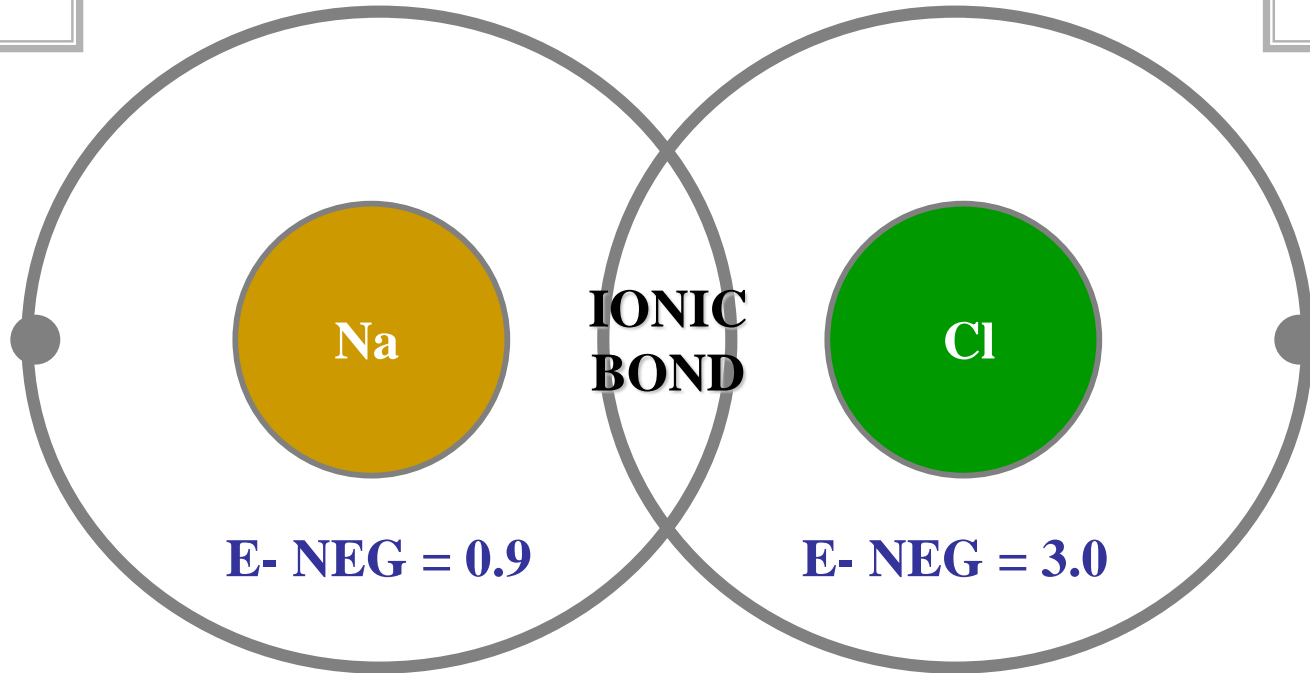
SODIUM

CHLORIDE

● = E-

IONIC BOND

NaCl = TABLE SALT



SODIUM

CHLORIDE

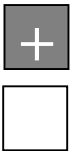
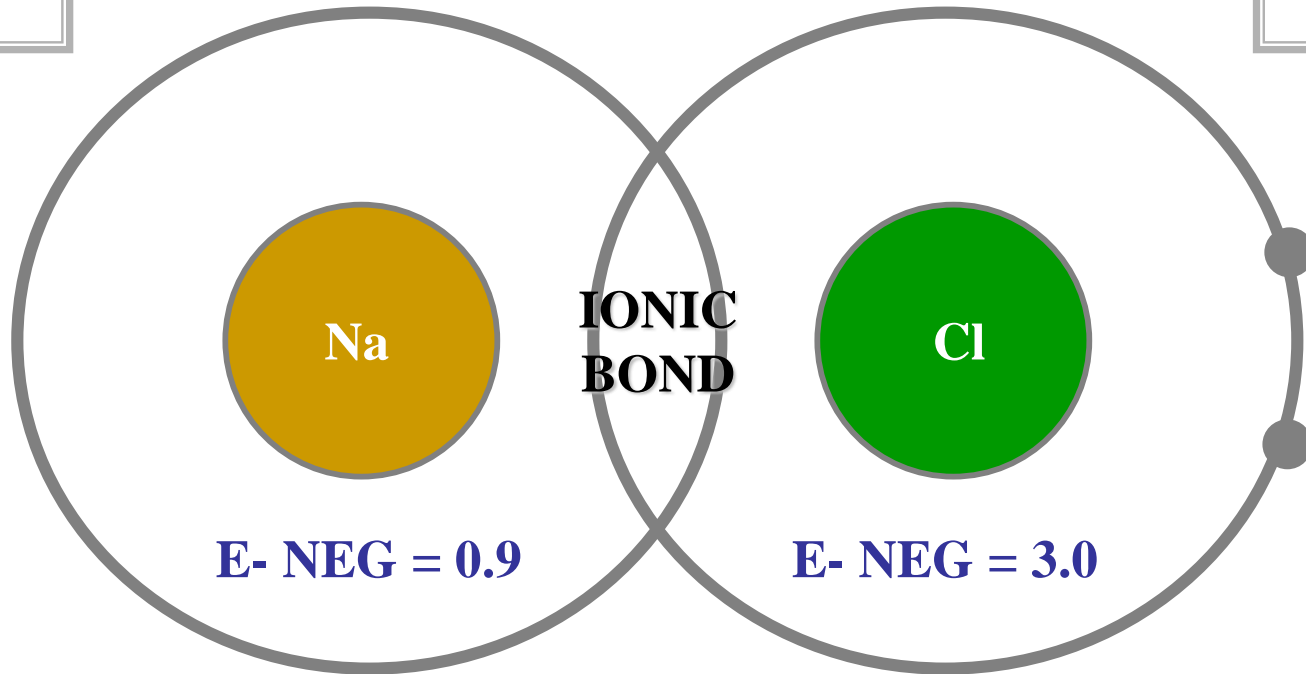
E- TRANSFER

● = E-



IONIC BOND

NaCl = TABLE SALT



SODIUM

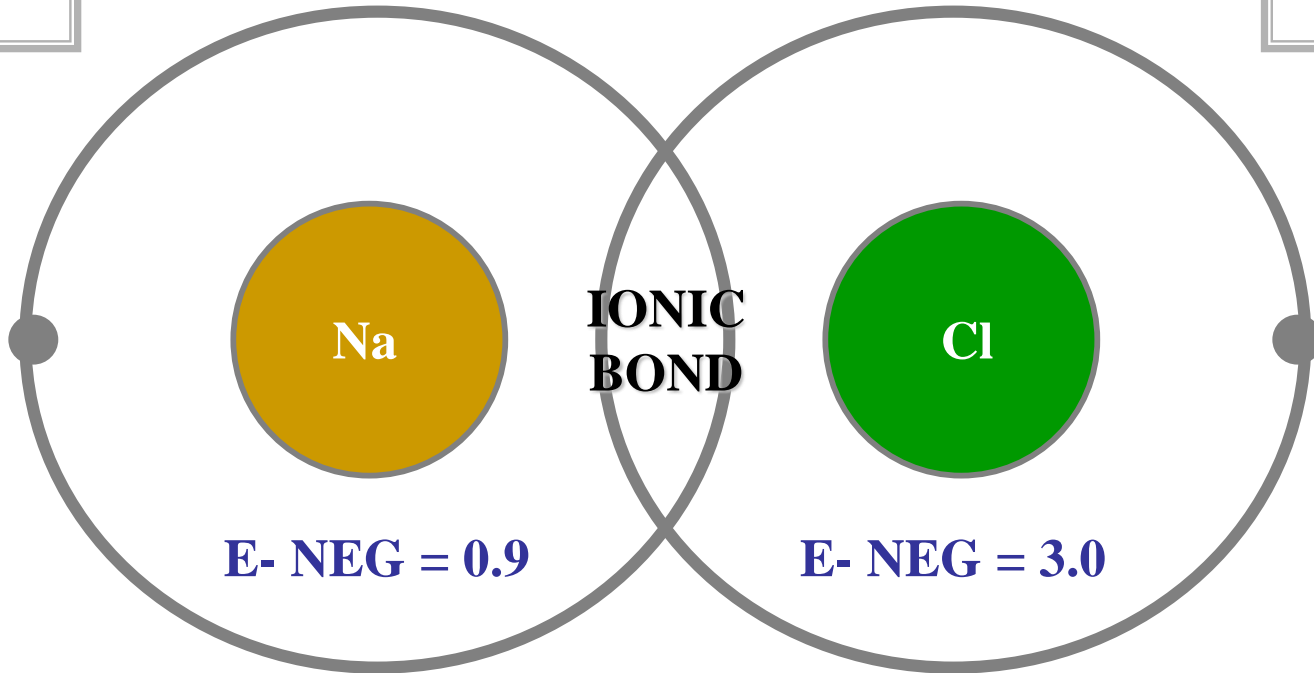
CHLORIDE

E- TRANSFER

● = E-

IONIC BOND

NaCl = TABLE SALT



SODIUM

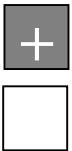
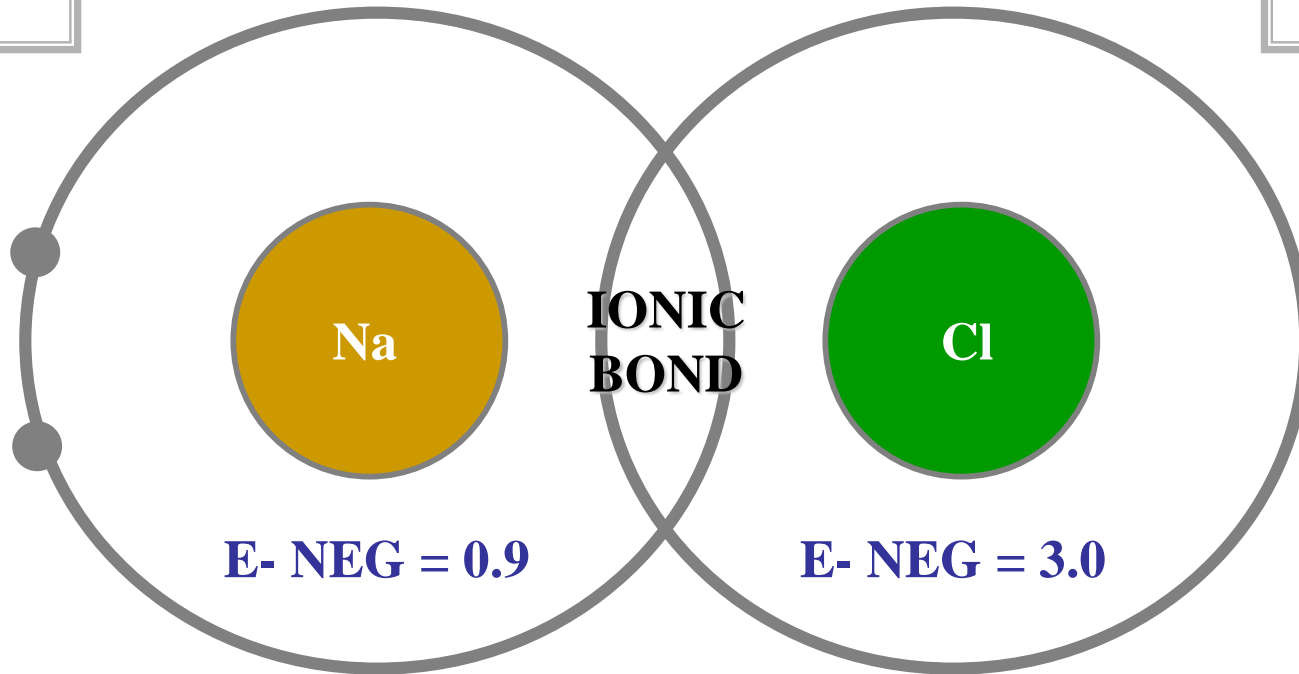
CHLORIDE

E- TRANSFER

● = E-

IONIC BOND

NaCl = TABLE SALT



SODIUM

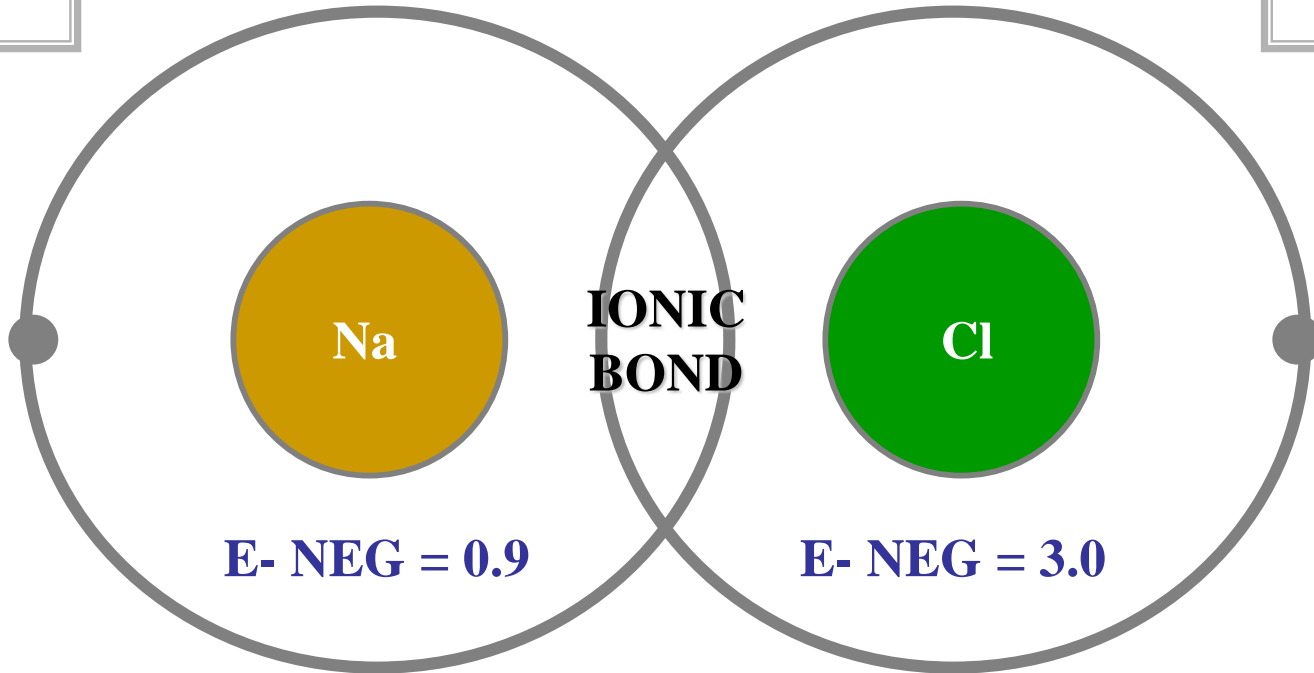
CHLORIDE

E- TRANSFER

● = E-

IONIC BOND

NaCl = TABLE SALT



SODIUM

CHLORIDE

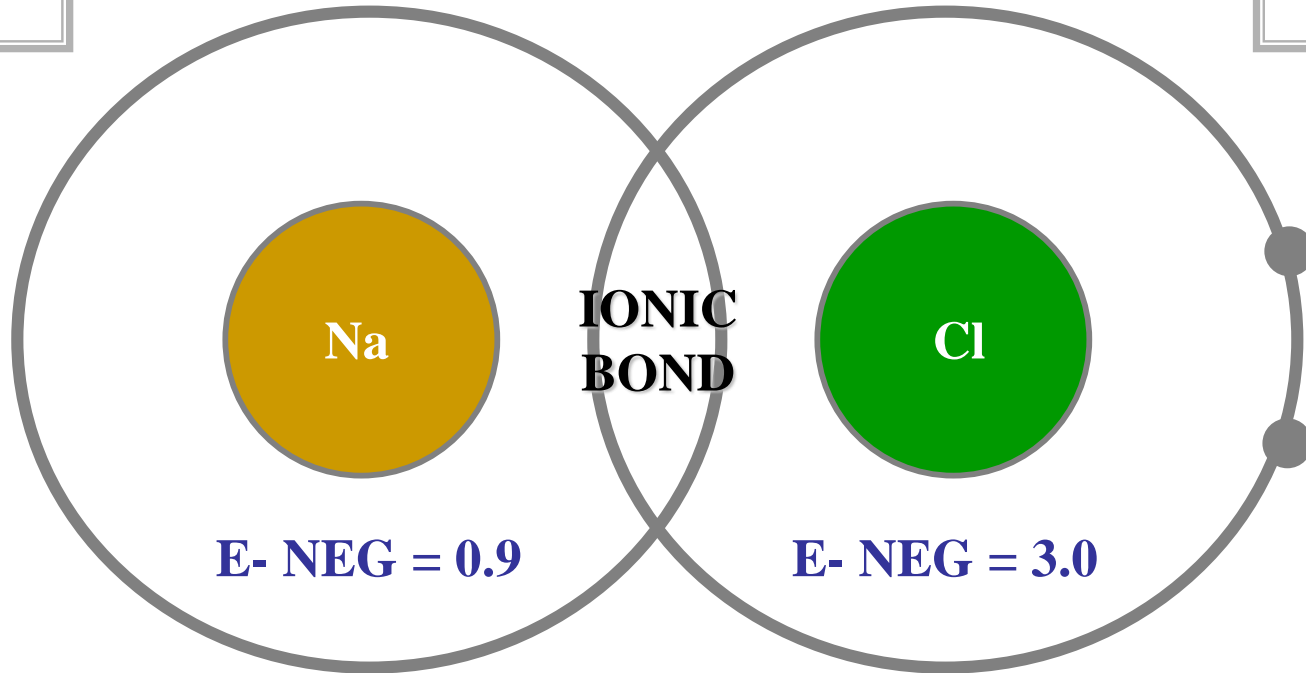
E- TRANSFER

● = E-



IONIC BOND

NaCl = TABLE SALT



S

+

SODIUM

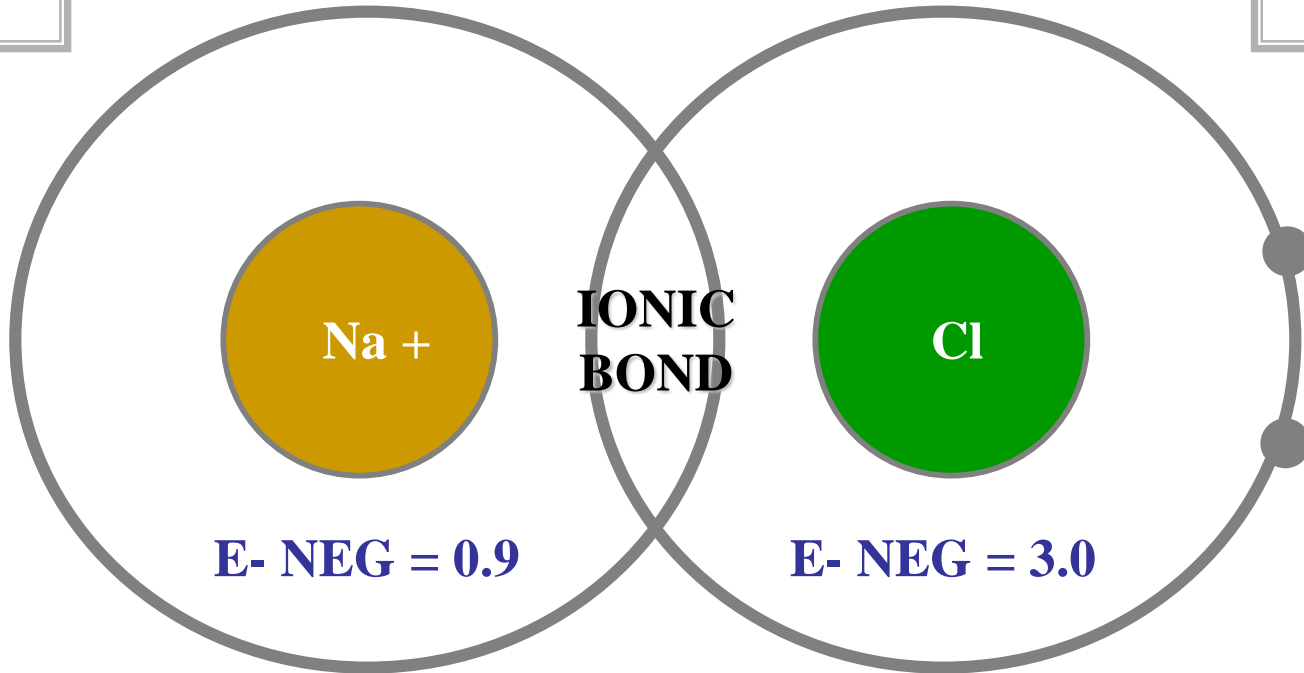
CHLORIDE

● = E-

E- TRANSFER: OUTCOME

IONIC BOND

NaCl = TABLE SALT



SODIUM

CHLORIDE

● = E-

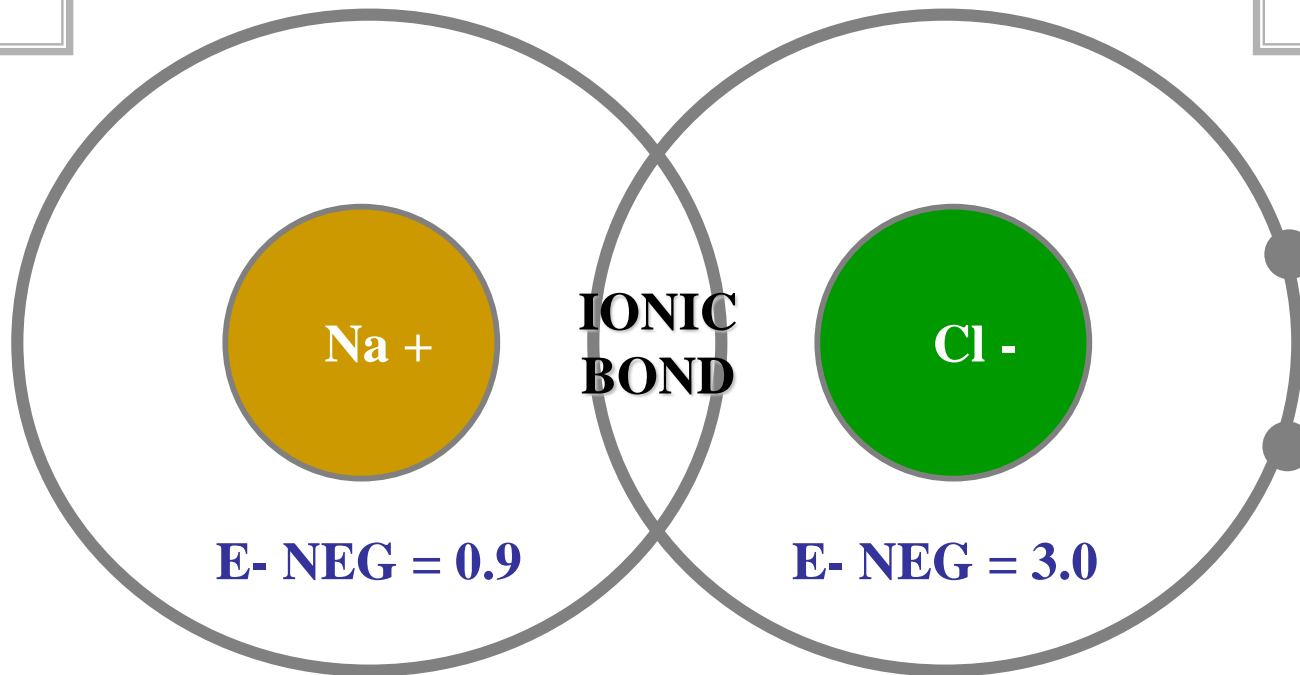
E- TRANSFER: OUTCOME

C

-

IONIC BOND

NaCl = TABLE SALT



SODIUM

CHLORIDE

● = E-

E- TRANSFER: OUTCOME

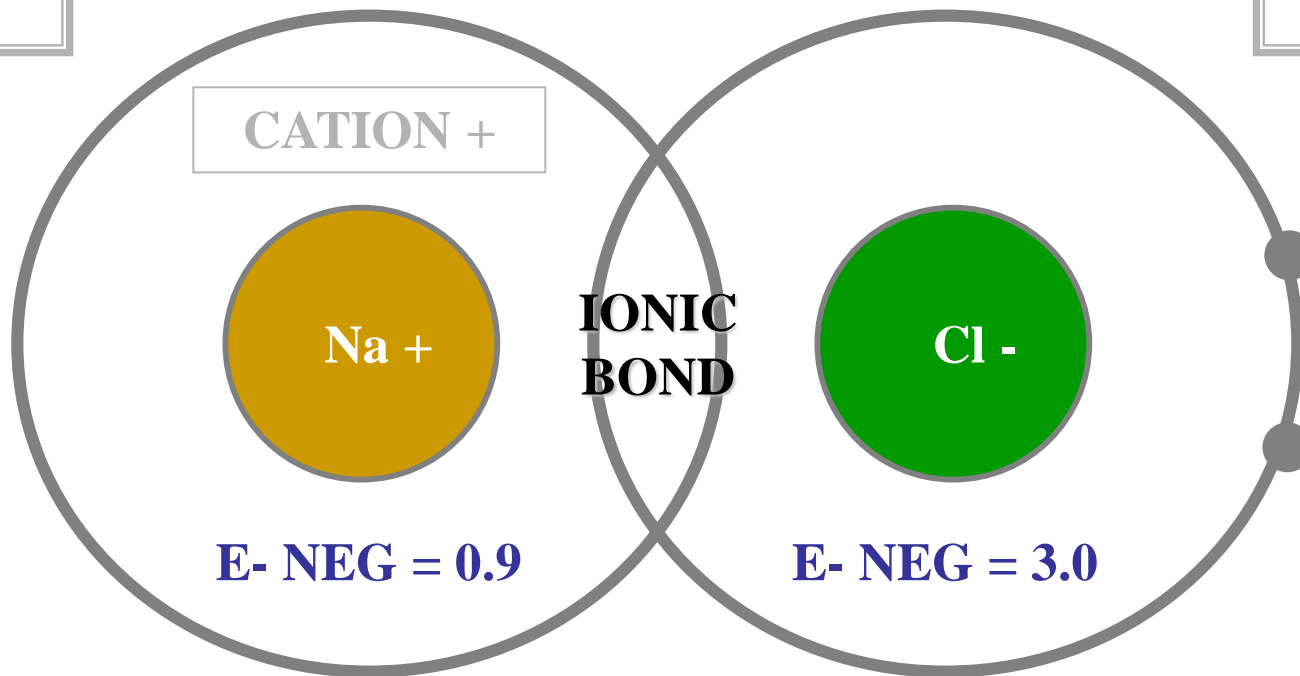
S

i

C

IONIC BOND

NaCl = TABLE SALT



C

A

SODIUM

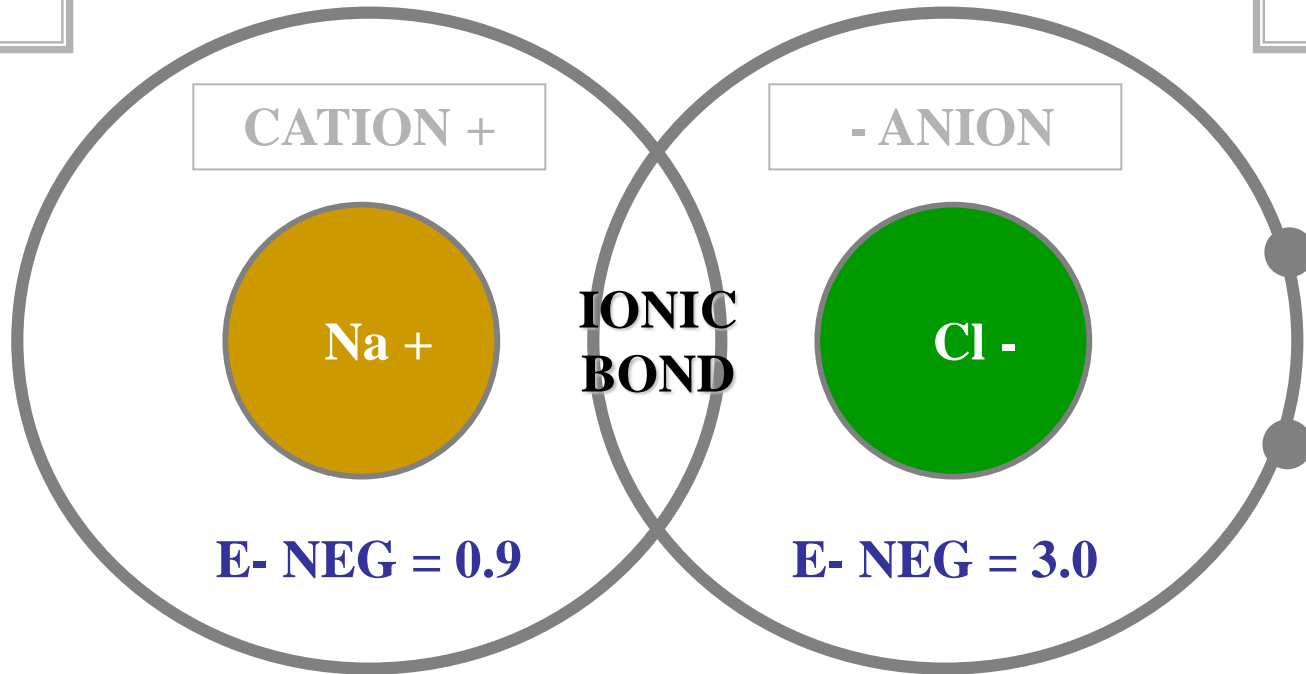
CHLORIDE

● = E-

E- TRANSFER: OUTCOME

IONIC BOND

NaCl = TABLE SALT



SODIUM

CHLORIDE

AT

↕

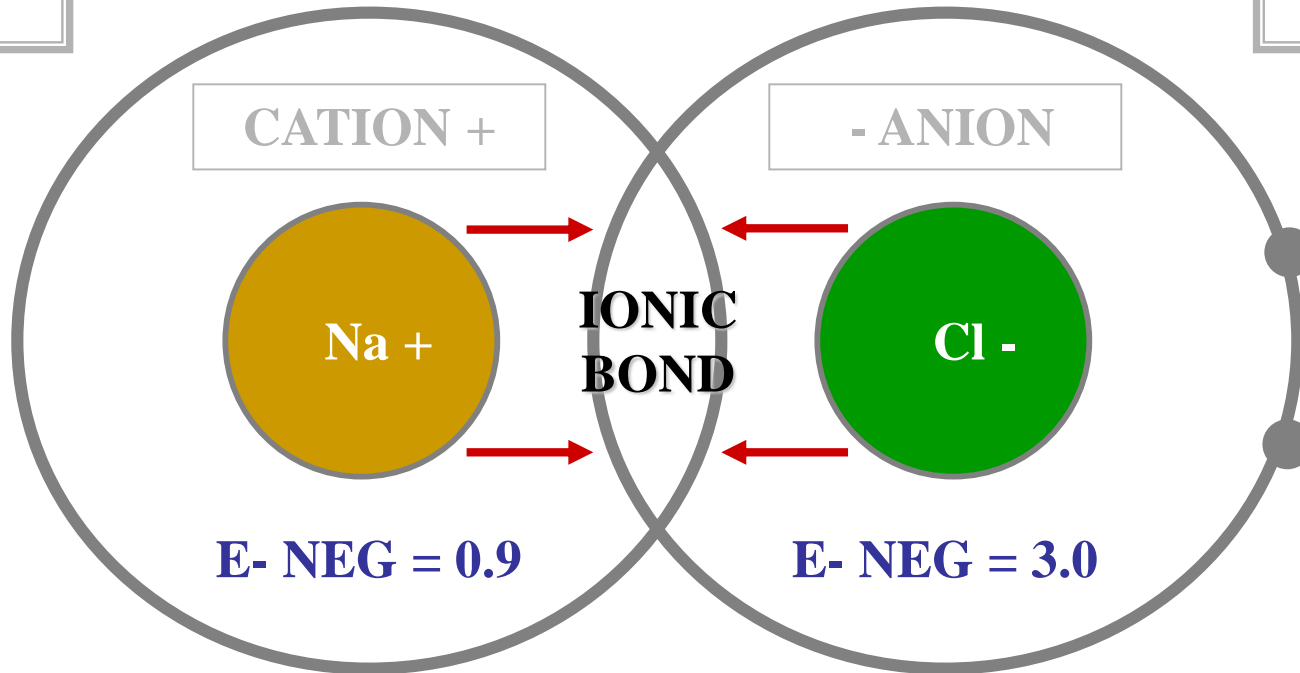
↕

● = E-

E- TRANSFER: OUTCOME

IONIC BOND

NaCl = TABLE SALT



IB

SODIUM

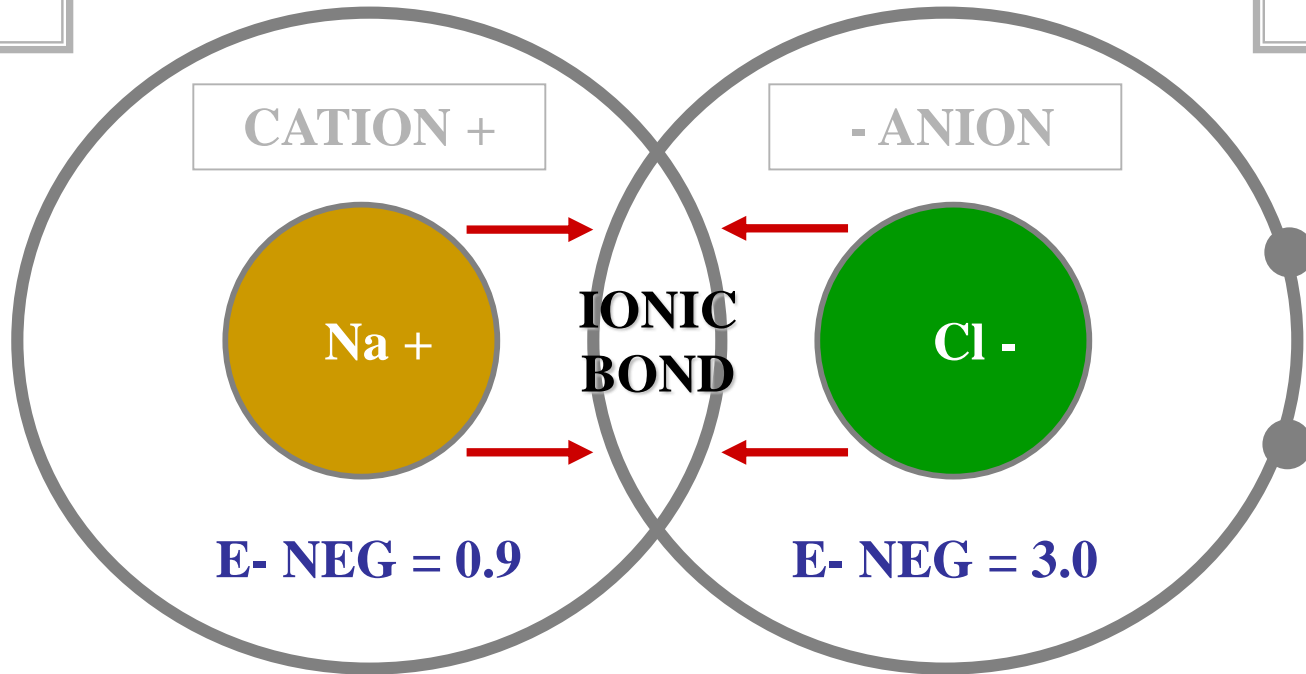
CHLORIDE

● = E-

CATION & ANION ATTRACT: OUTCOME

IONIC BOND

NaCl = TABLE SALT



D / E-
LS

SODIUM

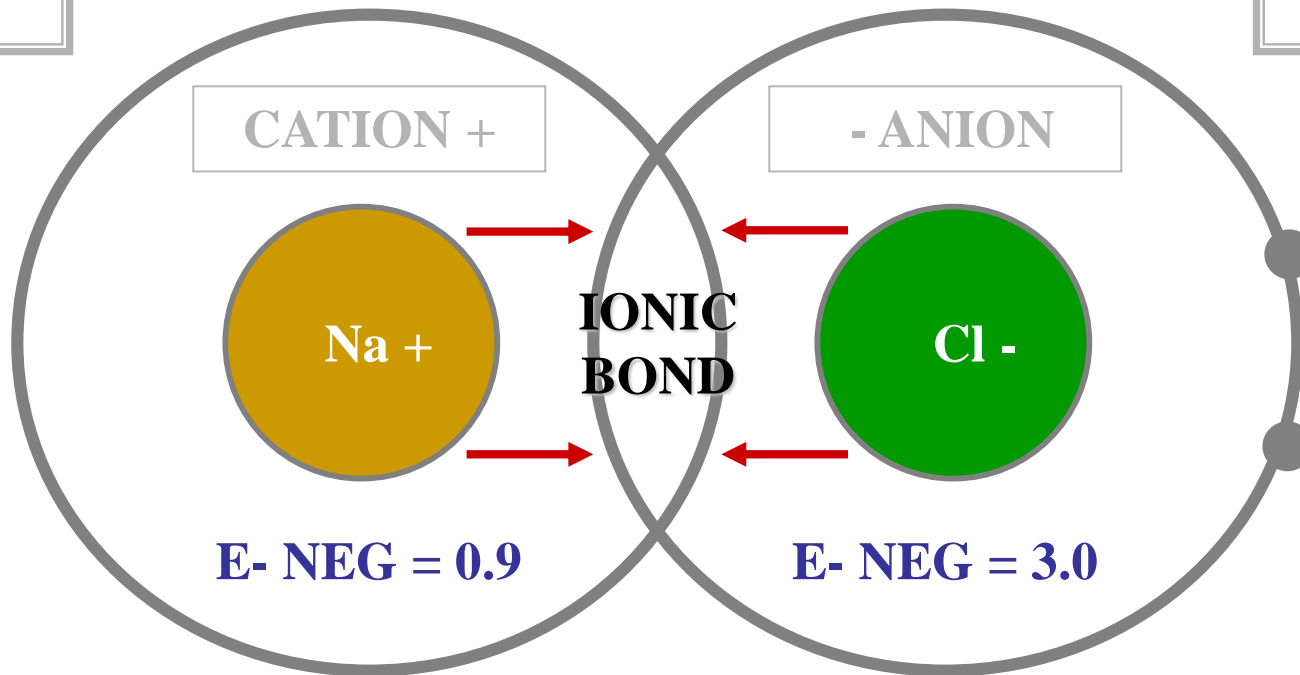
CHLORIDE

IONIC BOND

● = E-

IONIC BOND

NaCl = TABLE SALT



SODIUM

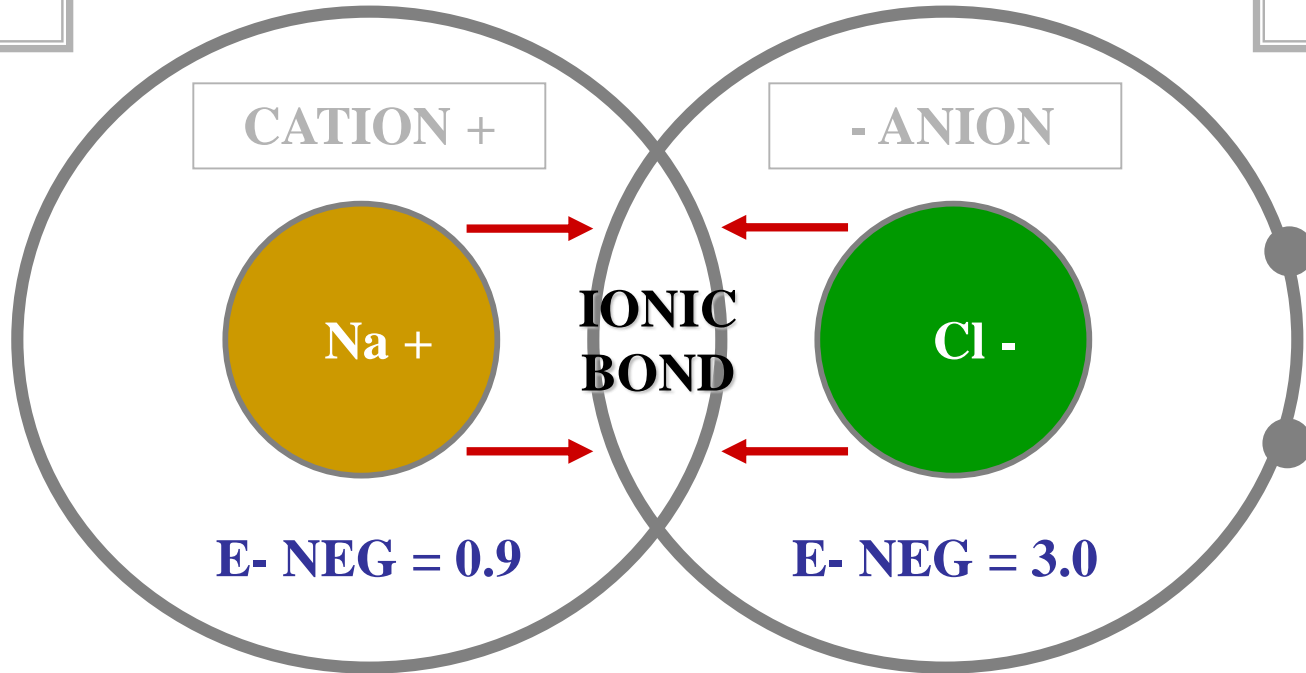
CHLORIDE

● = E-

LESS E- SHARING THAN COVALENT BONDS

IONIC BOND

NaCl = TABLE SALT



SODIUM

CHLORIDE

WEAK BOND

● = E-



CHEMICAL BONDS

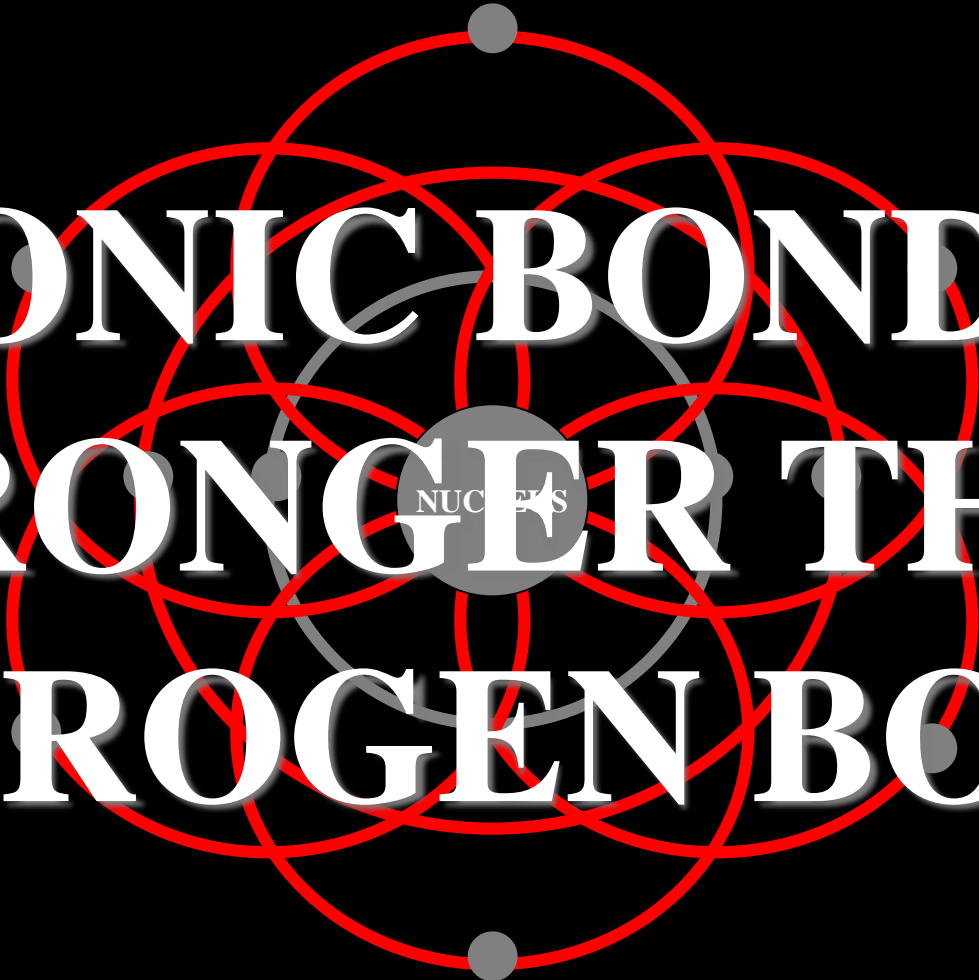


**IONIC BONDS
WEAKER THAN
COVALENT BONDS**

CHEMICAL BONDS



CHEMICAL BONDS



**IONIC BONDS
STRONGER THAN
HYDROGEN BONDS**

CHEMICAL BONDS

HYDROGEN BONDS

HYDROGEN BOND

HYDROGEN BOND

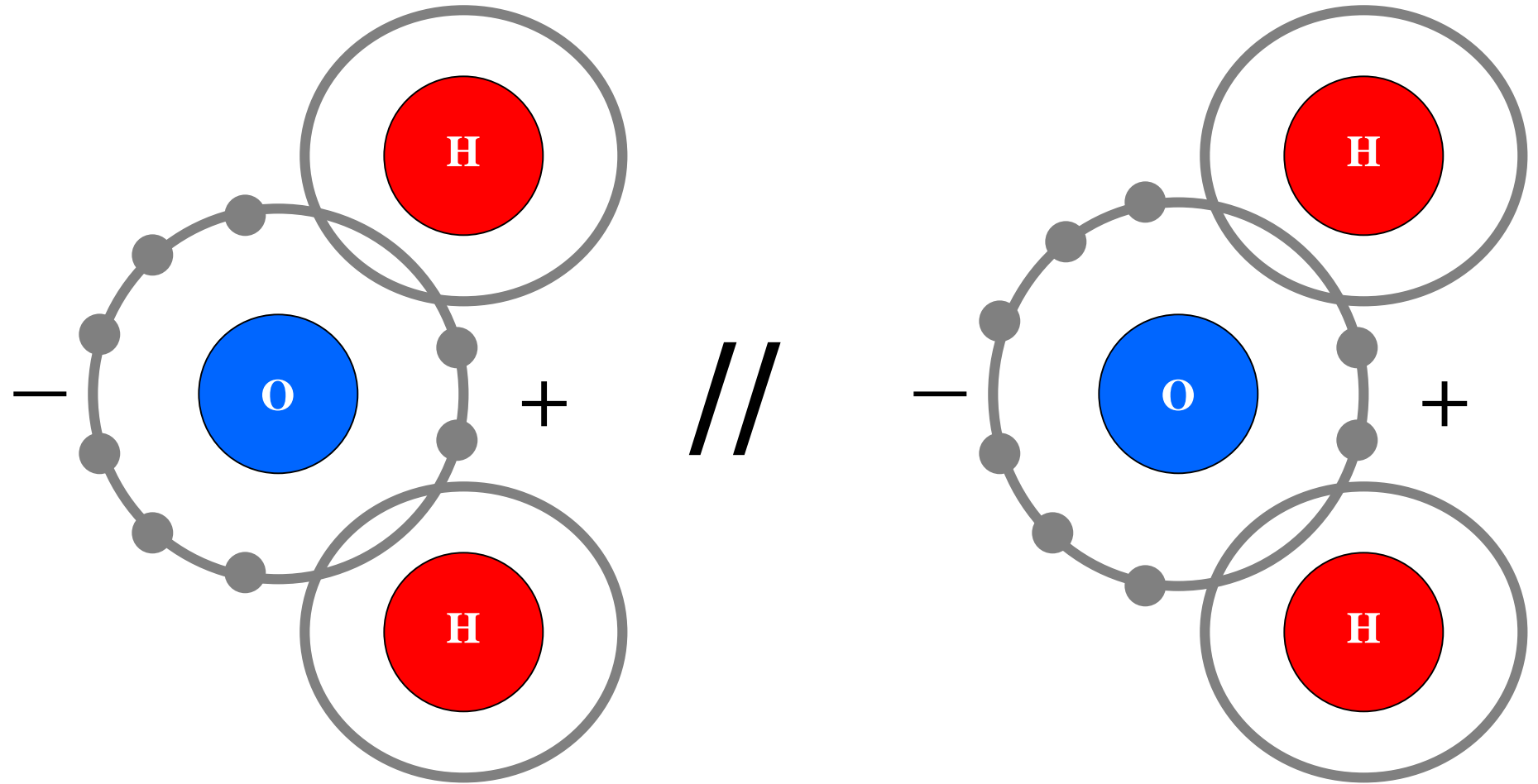


**POLAR COVALENTLY
BONDED H ATOM (+)
WEAKLY ATTRACTS
WITH AN ATOM (-)**

HYDROGEN BOND

**HYDROGEN
BOND
EXAMPLE
WATER
MOLECULES**

WATER MOLECULES

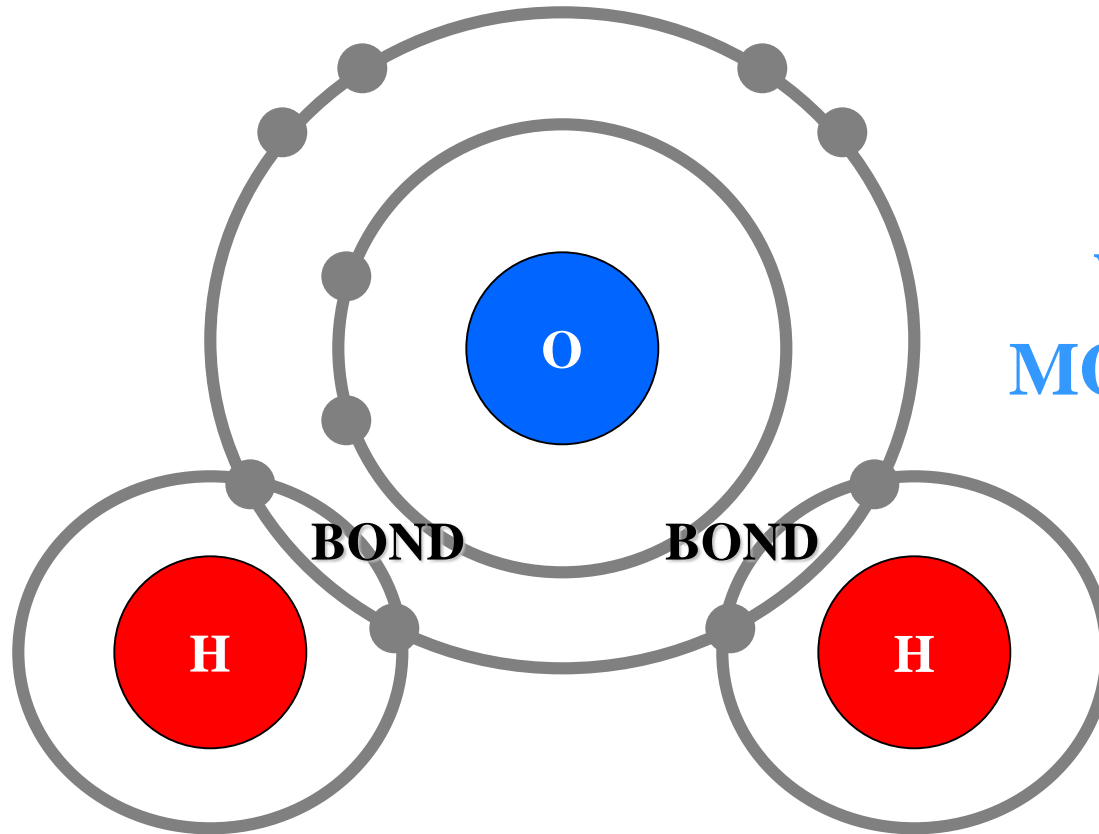


// = **HYDROGEN BOND**

WATER MOLECULE

OXYGEN

HYDROGEN



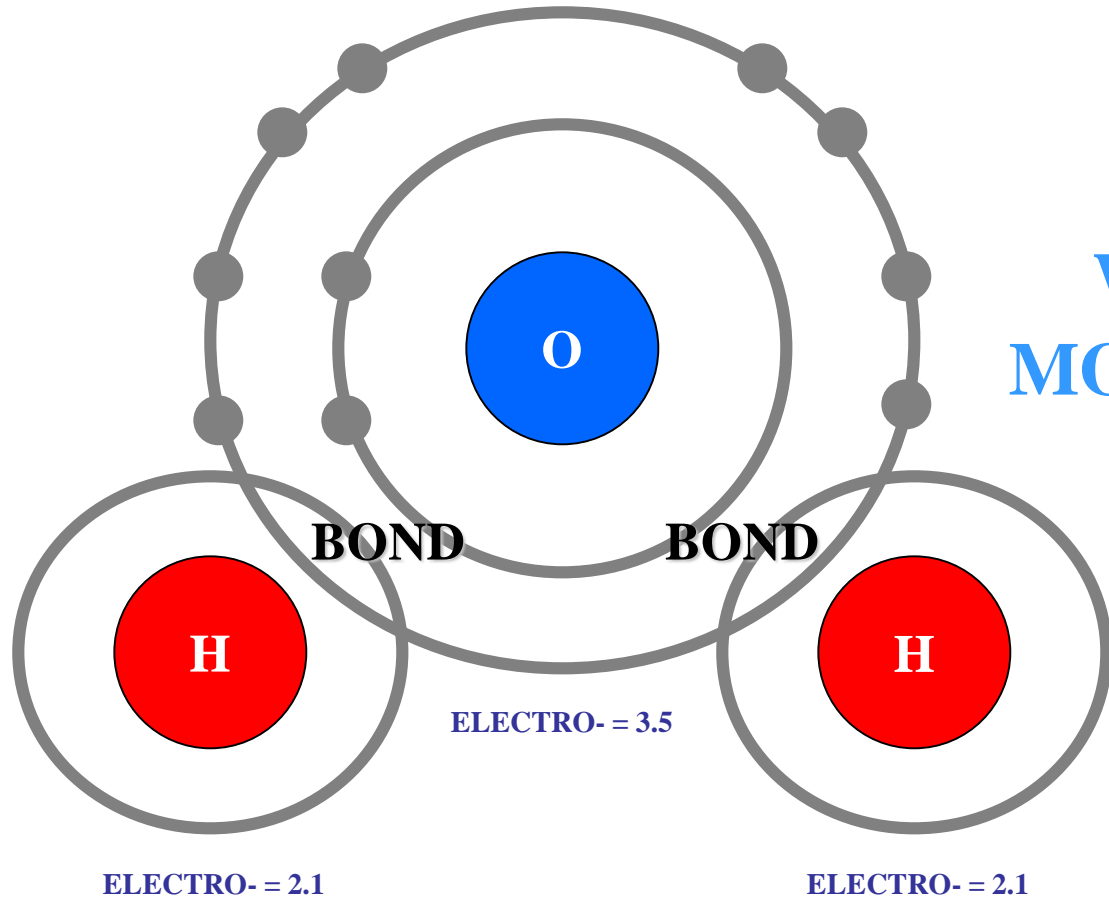
● = E-



COVALENT BOND

OXYGEN
HIGHER
ELECTRO-

HYDROGEN
LOWER
ELECTRO-



● = **E-**

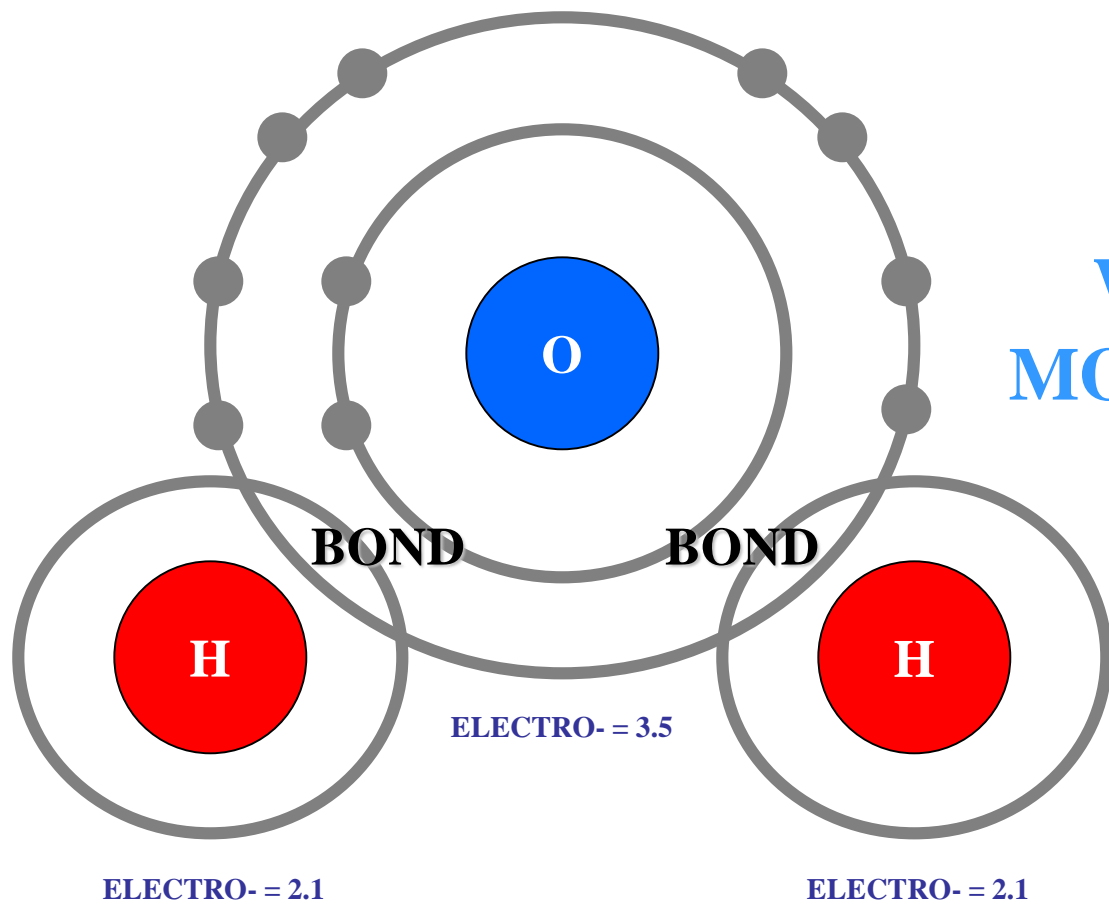
POLAR COVALENT BOND



E- SPEND MORE TIME ABOUT **OXYGEN**

OXYGEN
HIGHER
ELECTRO-

HYDROGEN
LOWER
ELECTRO-



● = E-

UNEQUAL E- SHARING

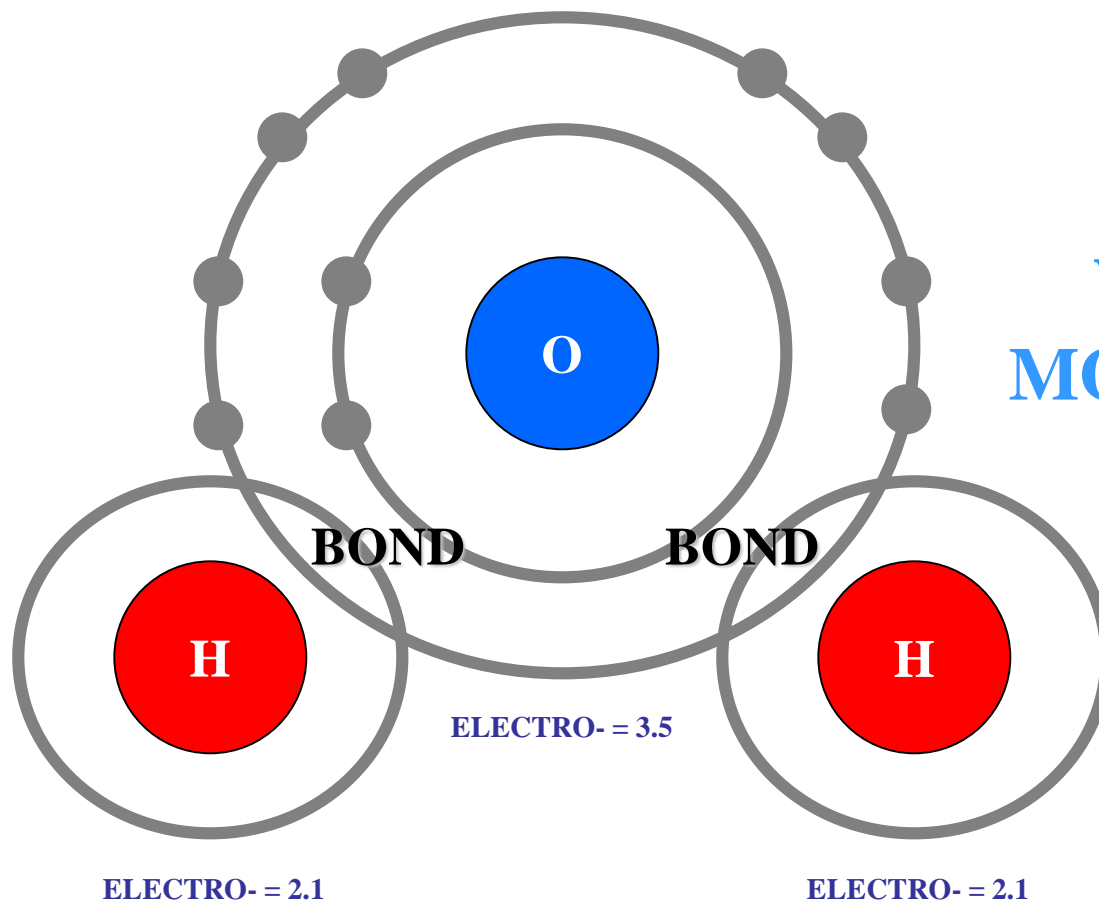
POLAR COVALENT BOND

? CHARGE

OXYGEN
HIGHER
ELECTRO-

HYDROGEN
LOWER
ELECTRO-

WATER
MOLECULE



● = E-

UNEQUAL E- SHARING

POLAR COVALENT BOND

?

H

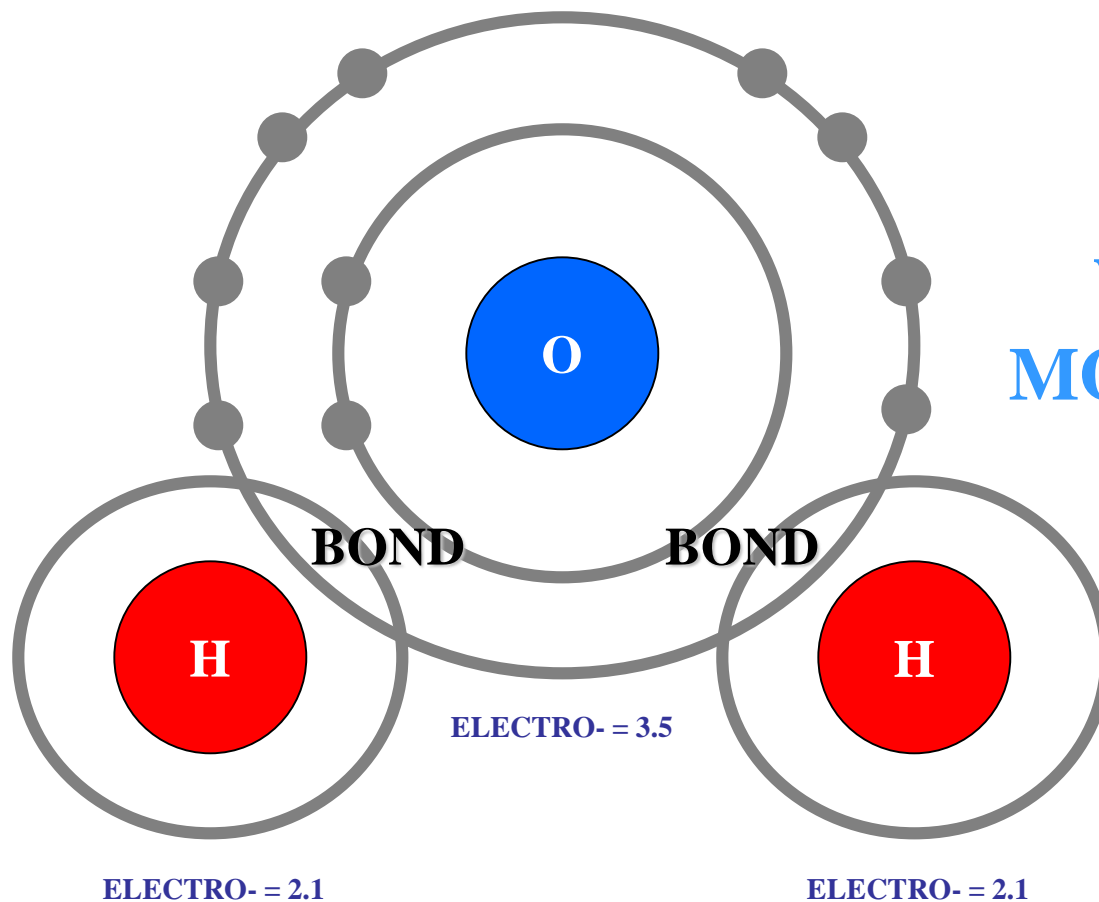
+

- CHARGE

OXYGEN
HIGHER
ELECTRO-

HYDROGEN
LOWER
ELECTRO-

WATER
MOLECULE



● = E-

UNEQUAL E- SHARING

POLAR COVALENT BOND

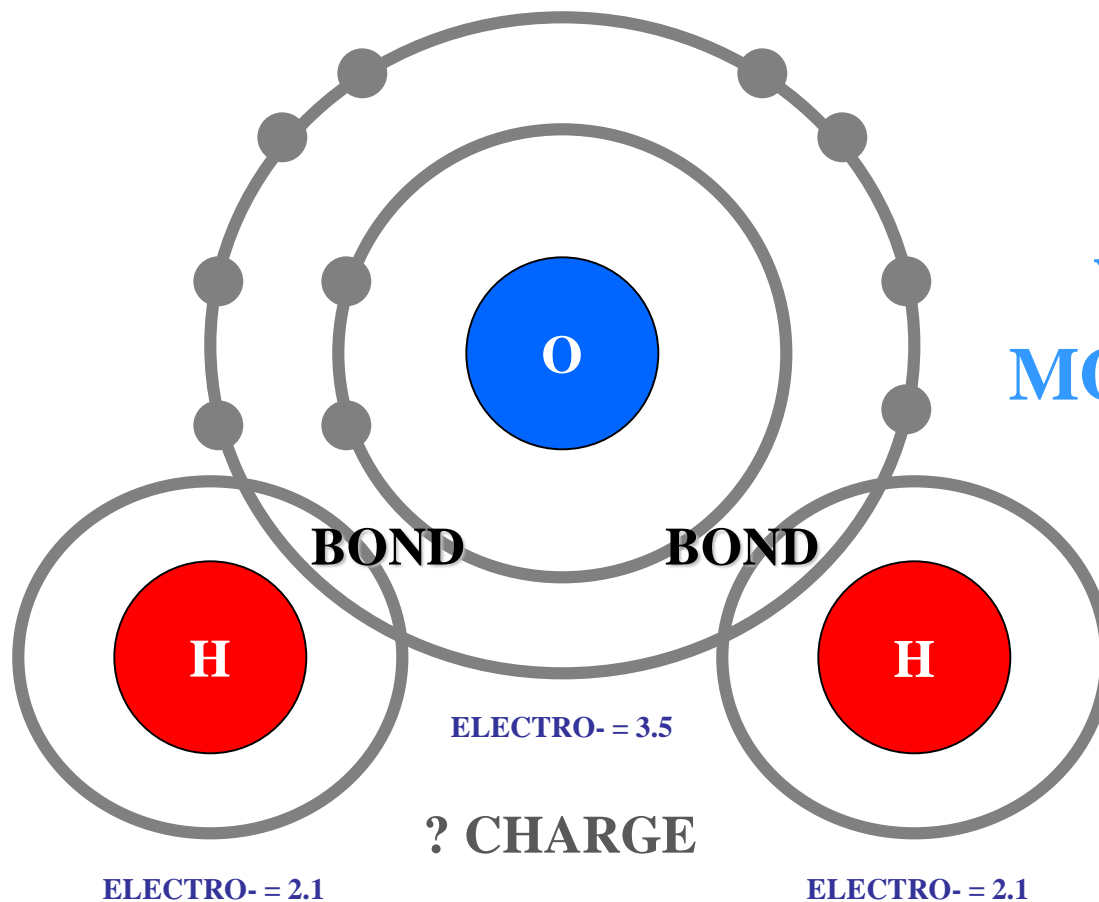
+

- CHARGE

OXYGEN
HIGHER
ELECTRO-

HYDROGEN
LOWER
ELECTRO-

WATER
MOLECULE



● = E-

UNEQUAL E- SHARING

POLAR COVALENT BOND

WM

HP

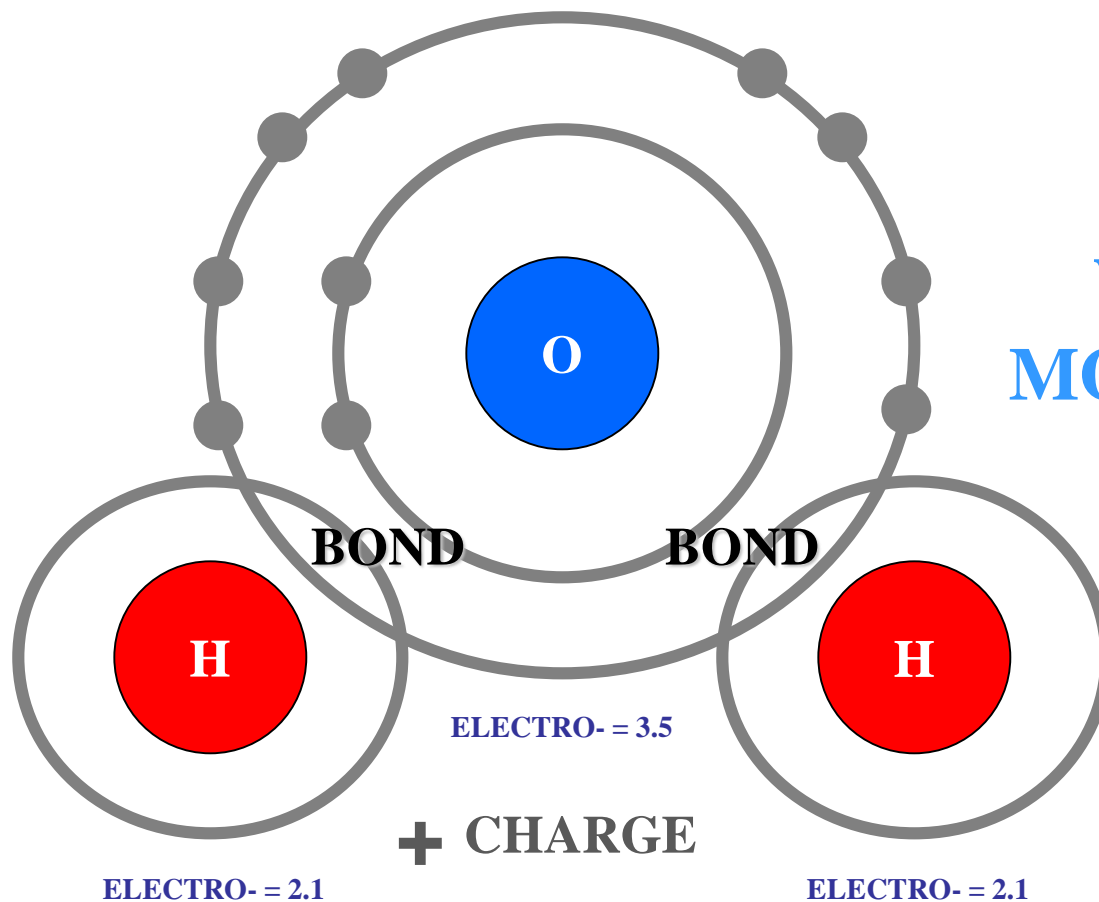


- CHARGE

OXYGEN
HIGHER
ELECTRO-

HYDROGEN
LOWER
ELECTRO-

WATER
MOLECULE



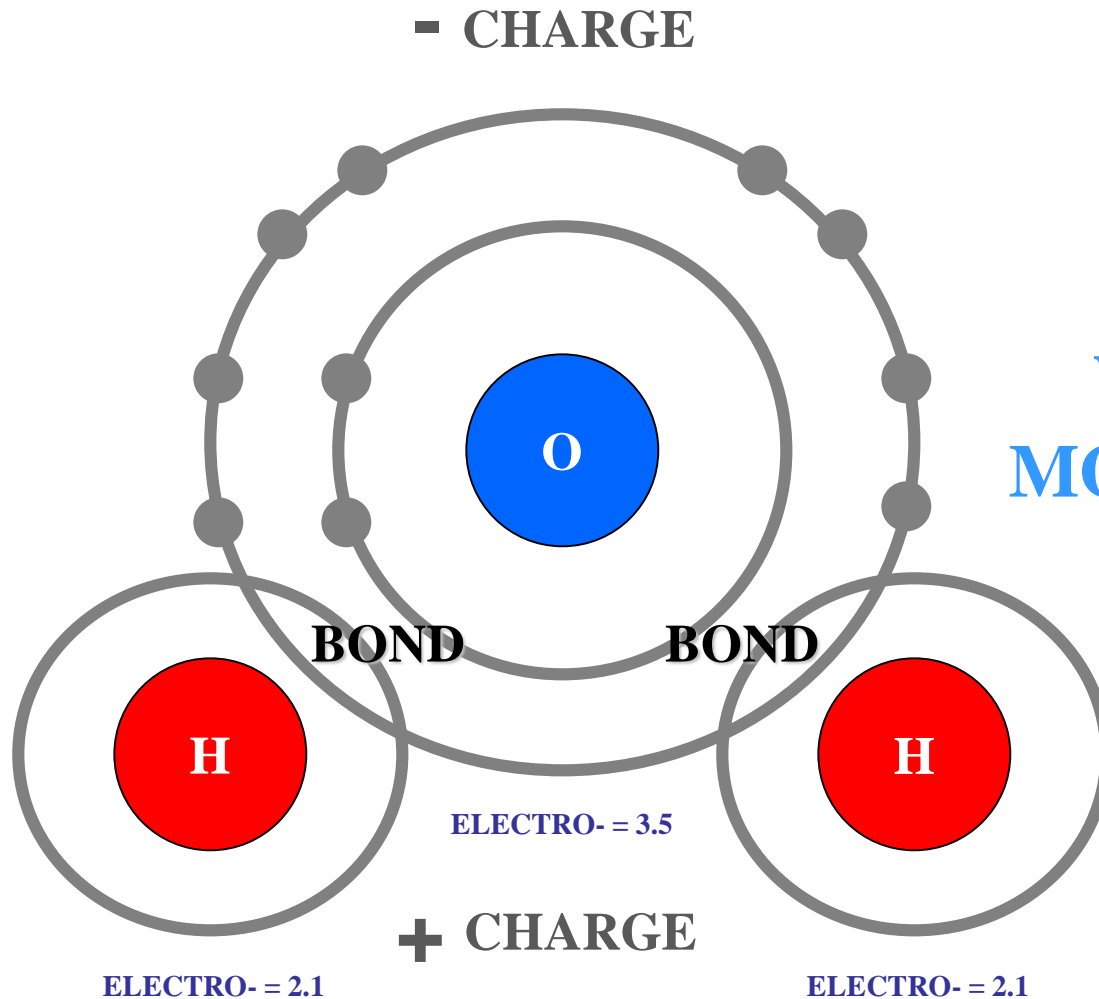
● = E-

UNEQUAL E- SHARING

POLAR COVALENT BOND

OXYGEN
HIGHER
ELECTRO-

HYDROGEN
LOWER
ELECTRO-



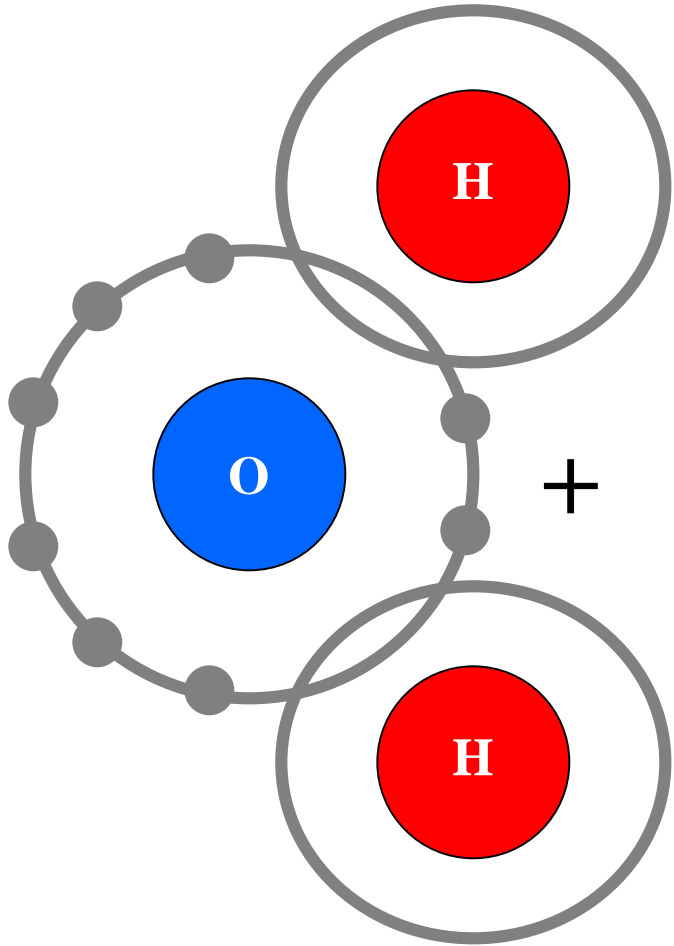
● = E-

HIGHLY POLAR

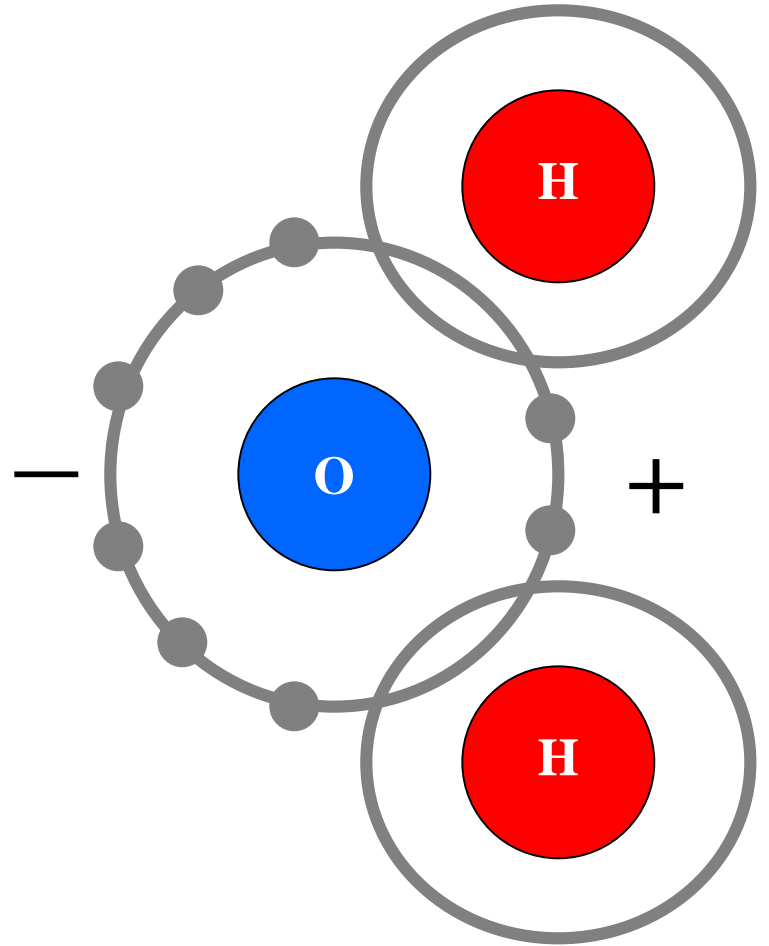
WATER MOLECULES



HP



WATER

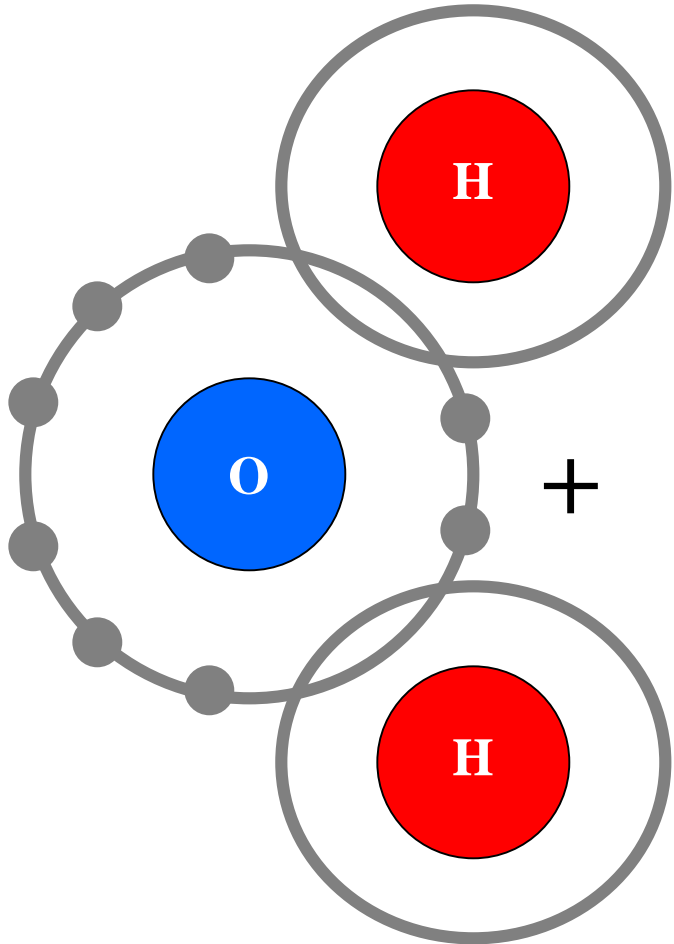


WATER

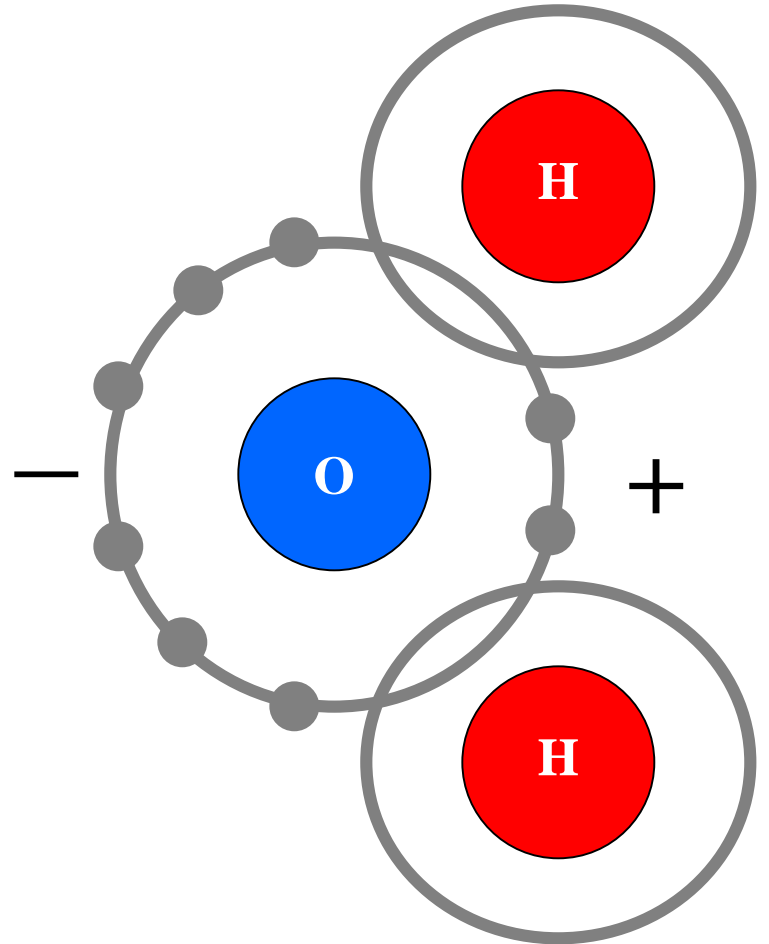
WATER MOLECULES

H

+

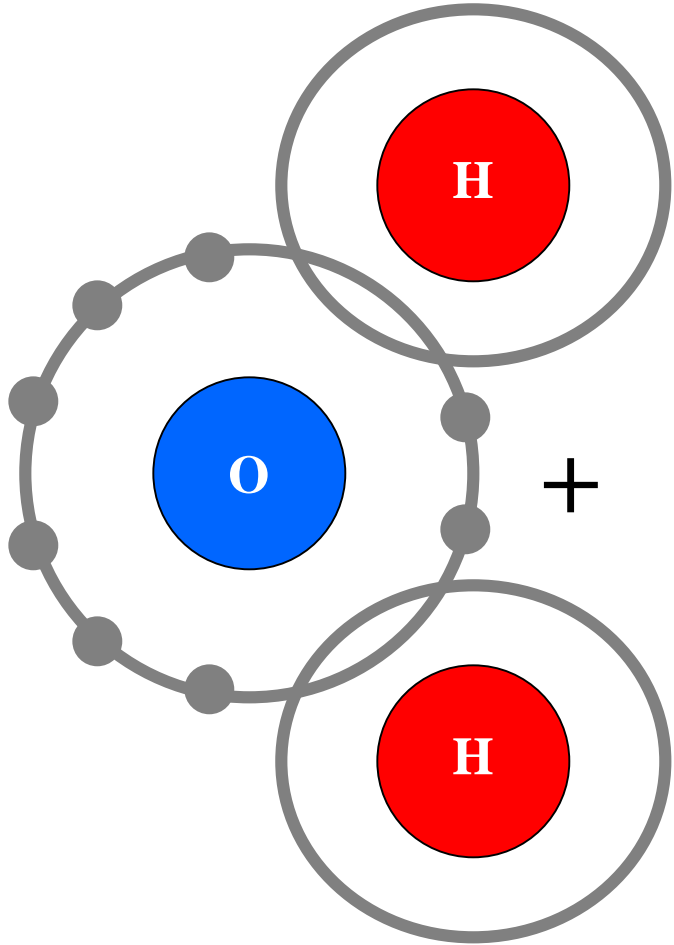


HIGHLY POLAR

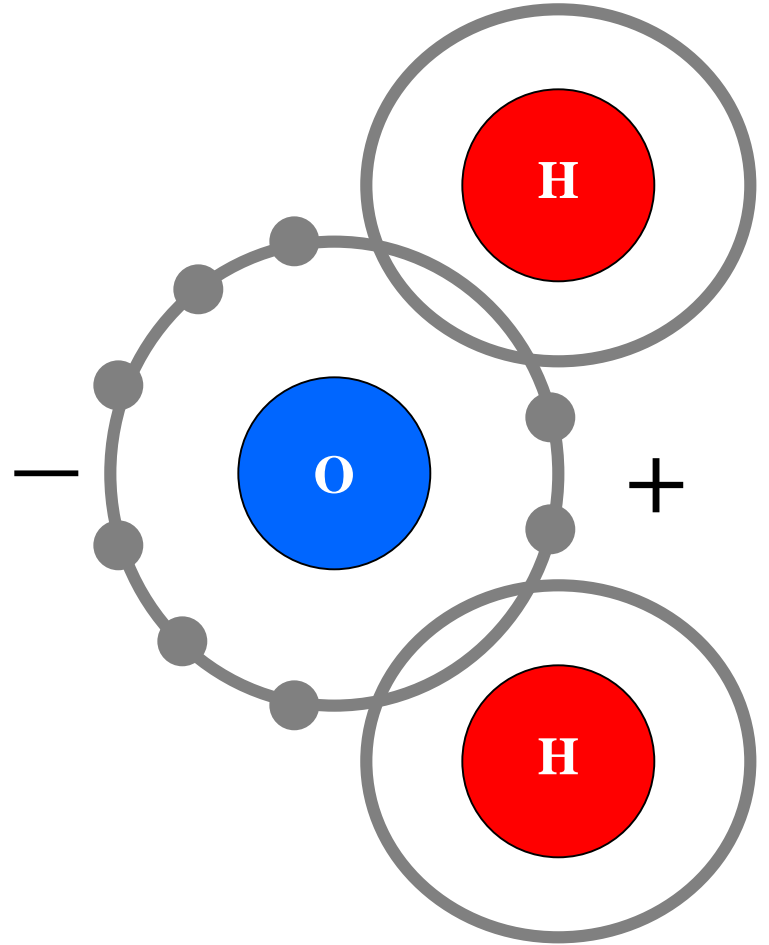


HIGHLY POLAR

WATER MOLECULES

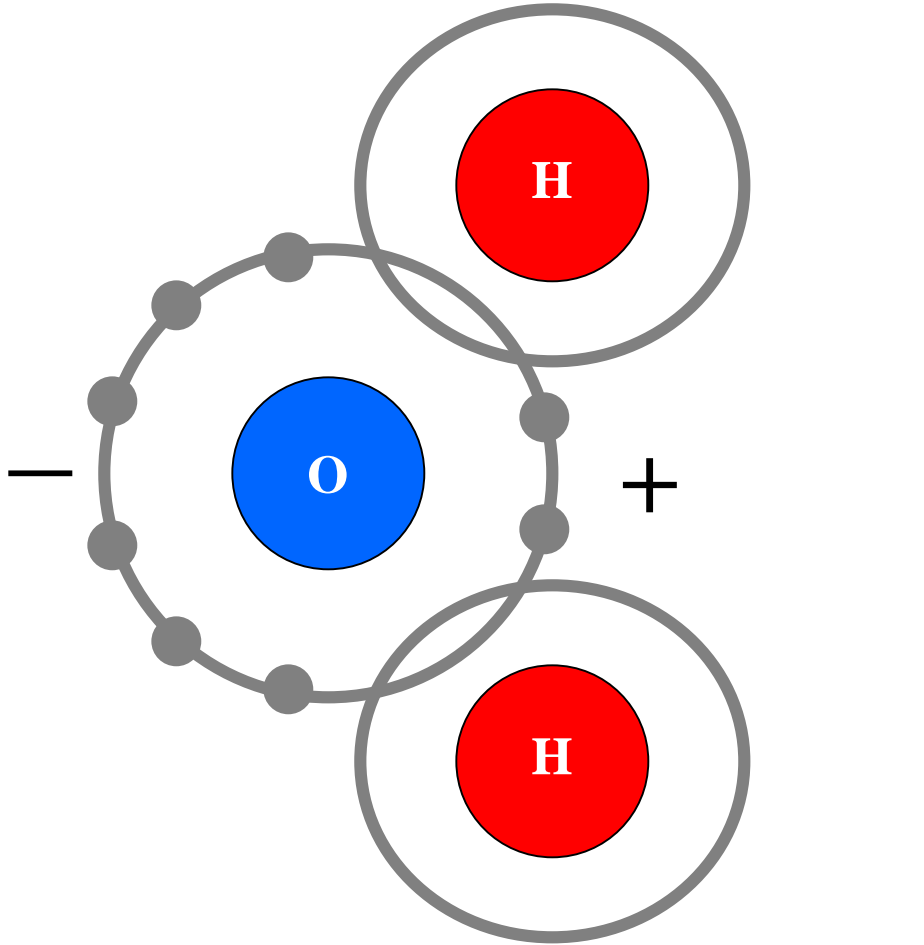


HYDROGEN POLE +

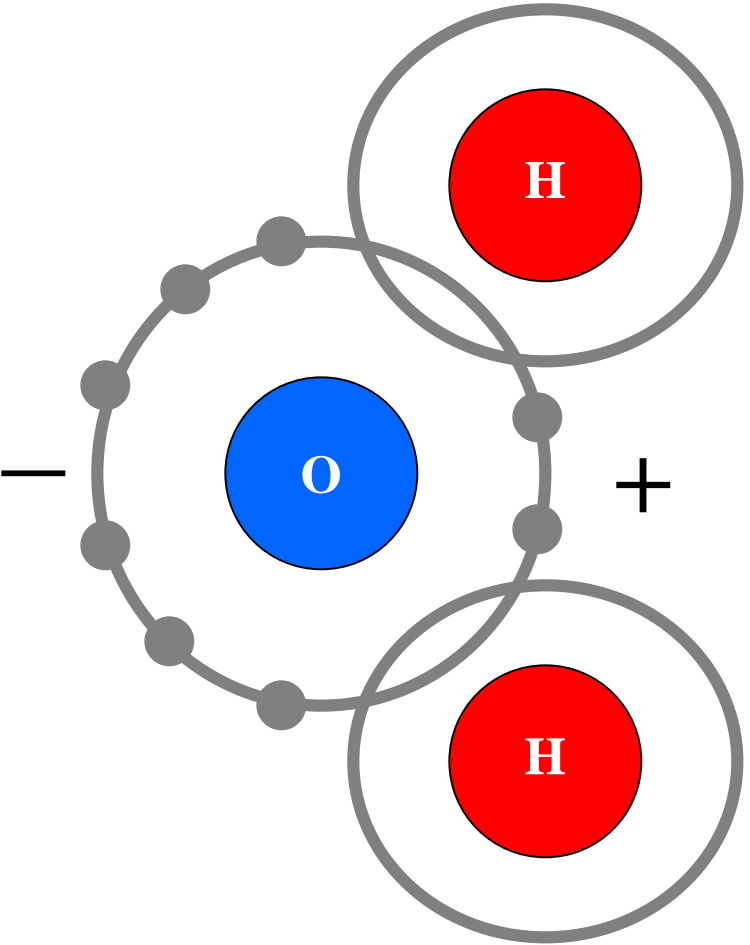


HIGHLY POLAR

WATER MOLECULES

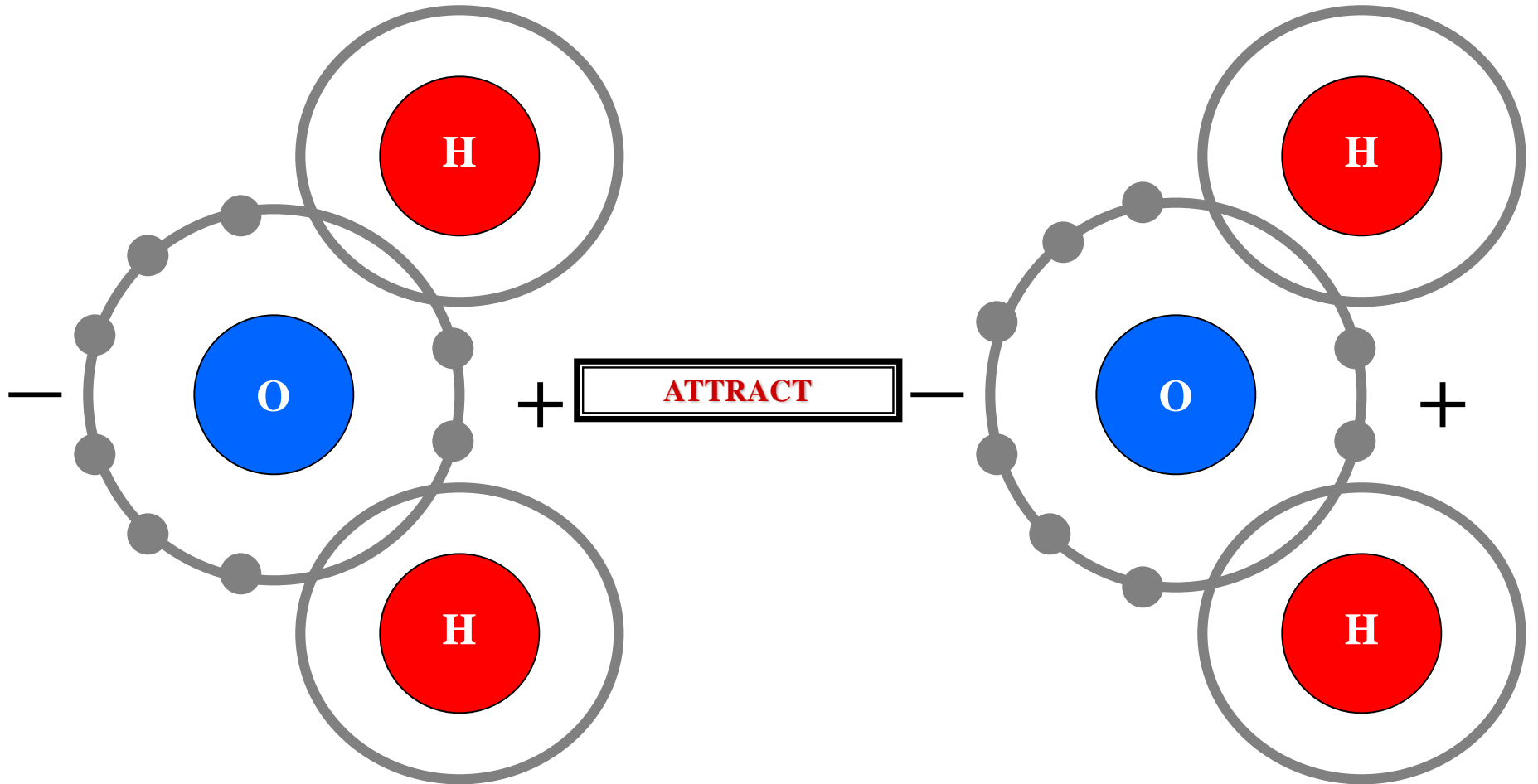


HYDROGEN POLE +



— **OXYGEN POLE**

WATER MOLECULES



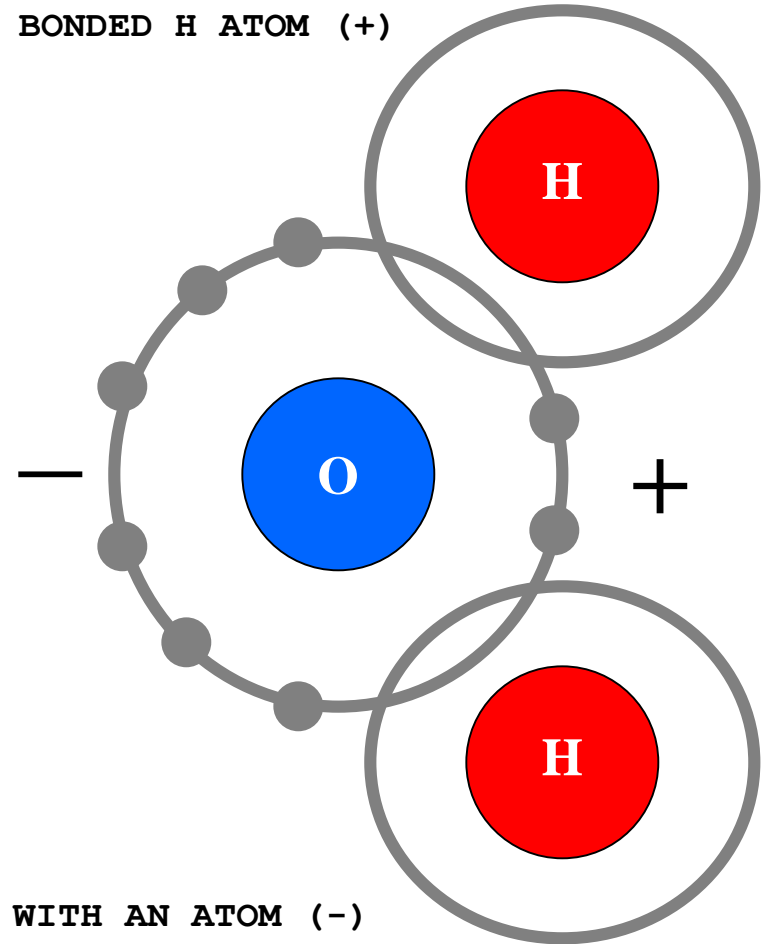
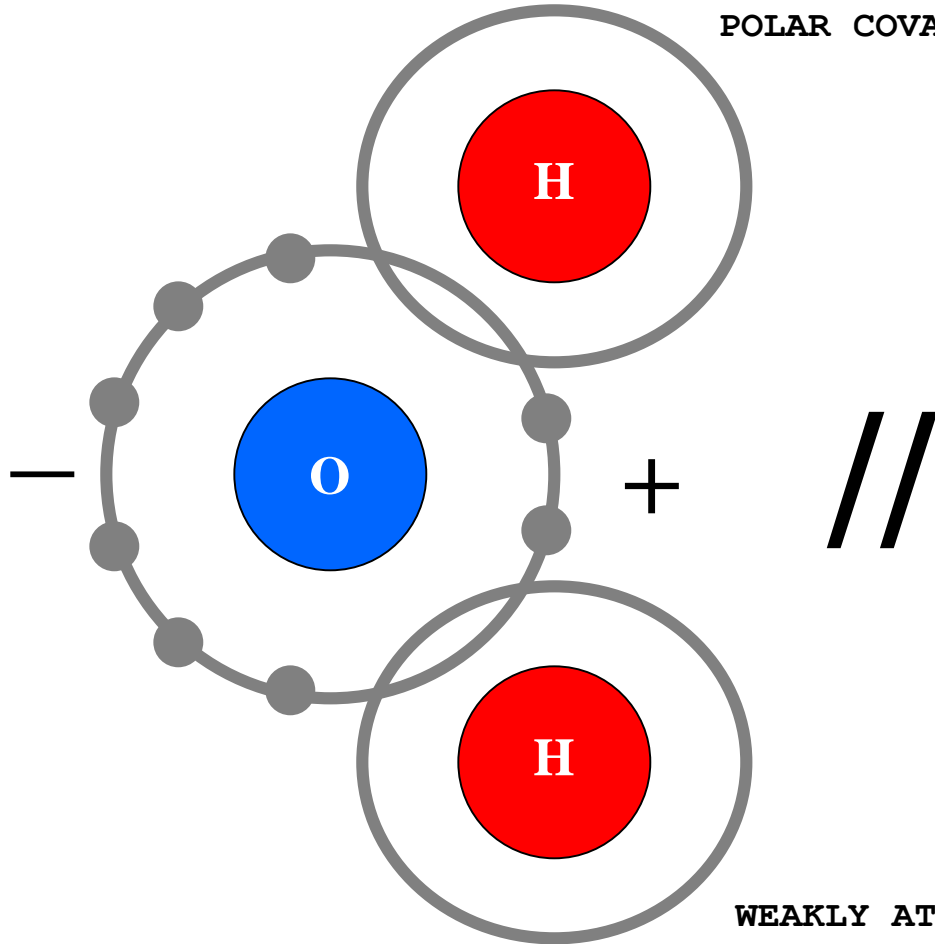
HYDROGEN POLE +

- OXYGEN POLE

WATER MOLECULES



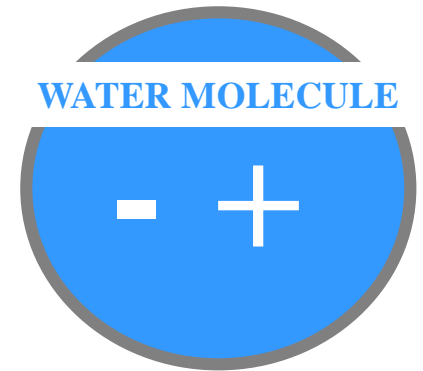
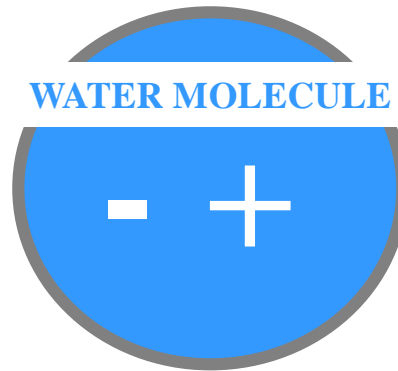
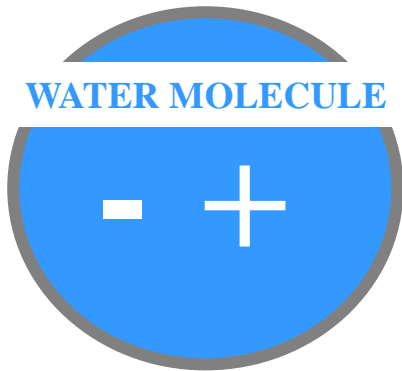
POLAR COVALENTLY BONDED H ATOM (+)



WEAKLY ATTRACTS WITH AN ATOM (-)

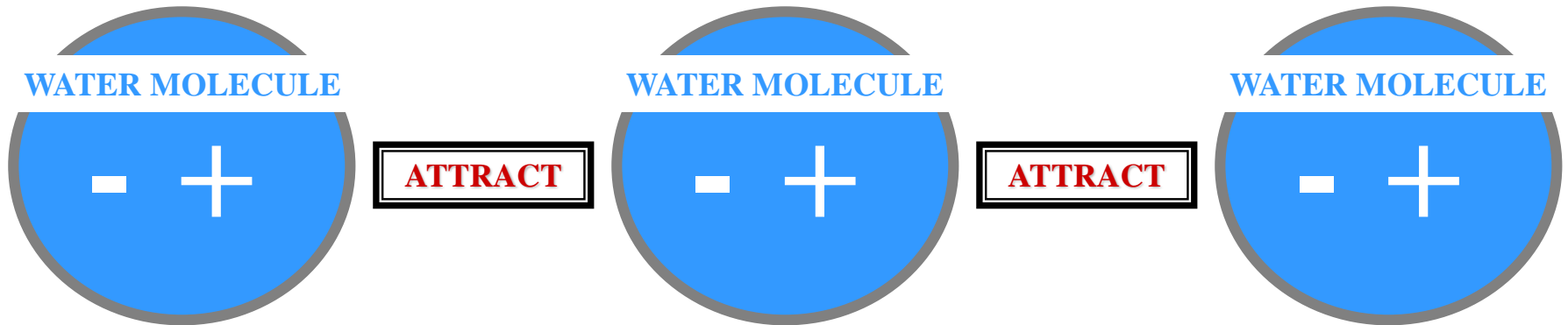
// = **HYDROGEN BOND**

WATER MOLECULES HYDROGEN BONDS



WATER = HIGHLY POLAR

WATER MOLECULES HYDROGEN BONDS

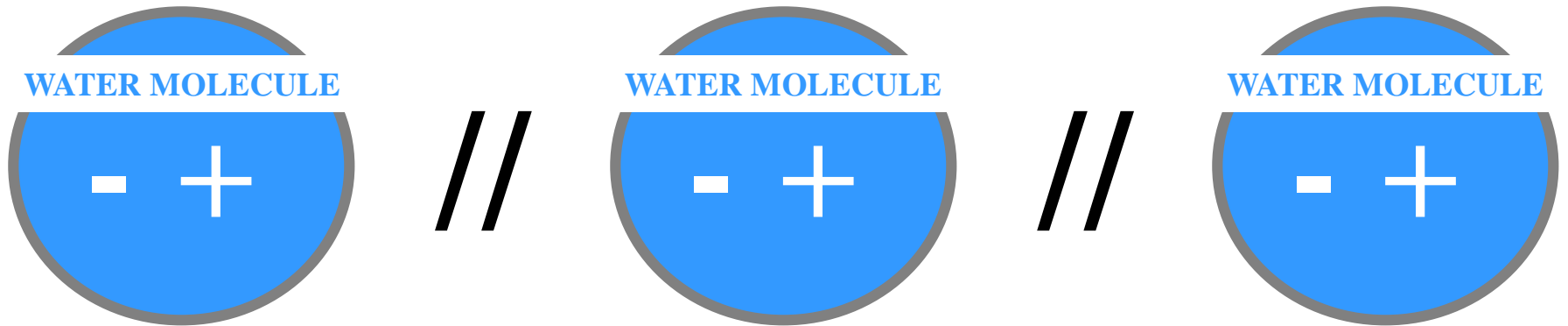


WATER = HIGHLY POLAR



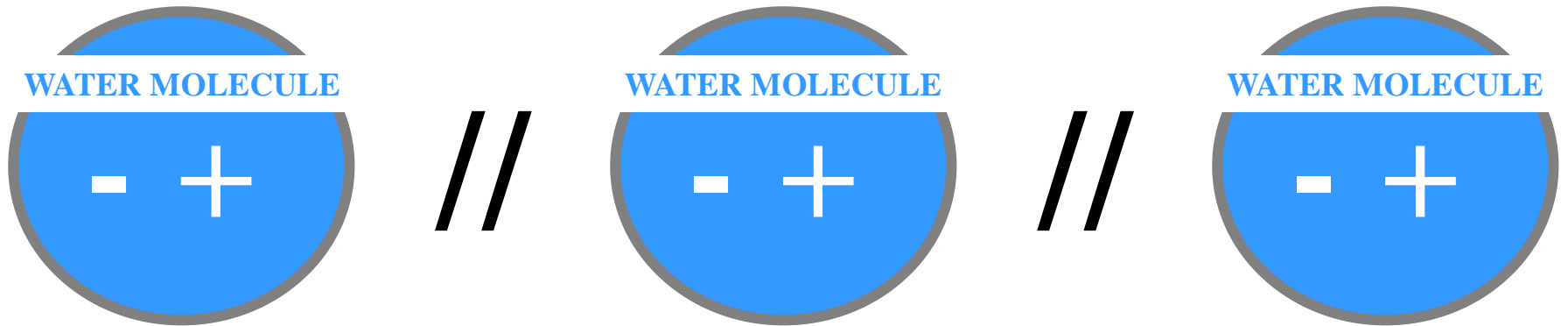
E-

WATER MOLECULES HYDROGEN BONDS



// = **HYDROGEN BOND**

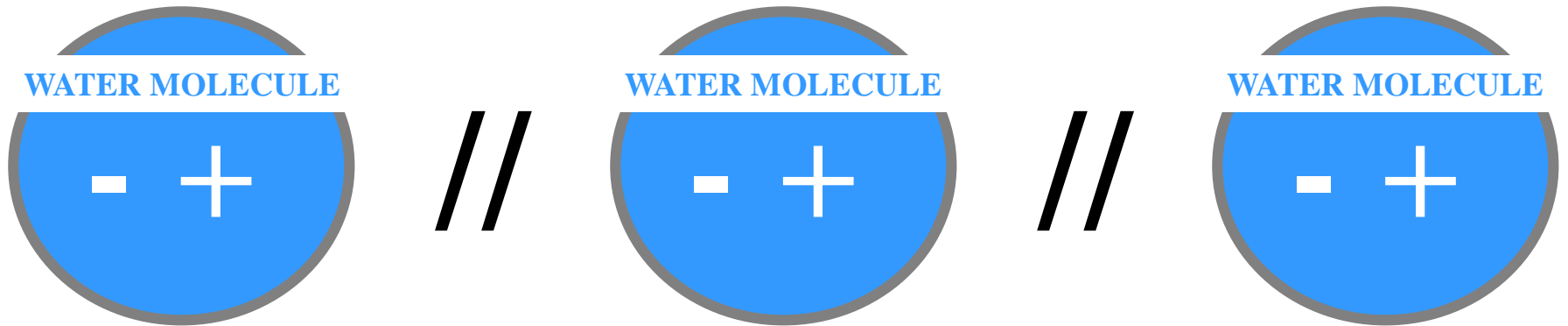
WATER MOLECULES HYDROGEN BONDS



E- SHARING: ?

// = HYDROGEN BOND

WATER MOLECULES HYDROGEN BONDS

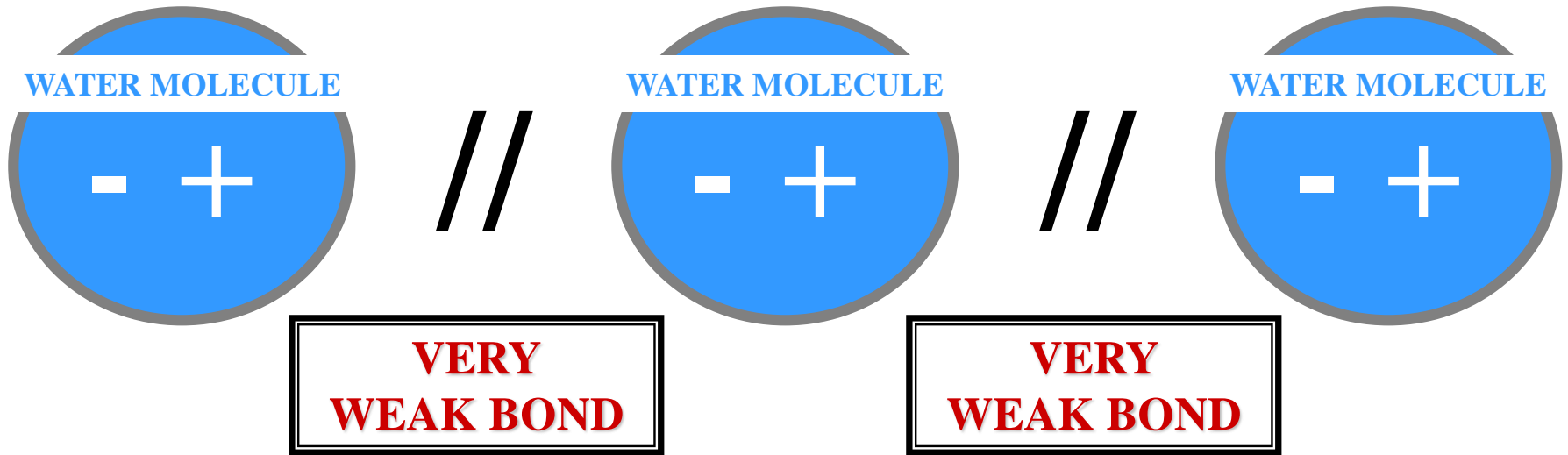


E- SHARING: ABSENT - OUTCOME

// = HYDROGEN BOND



WATER MOLECULES HYDROGEN BONDS



// = **HYDROGEN BOND**



CHEMICAL BONDS

HYDROGEN BONDS

VERY WEAK

NUCLEUS

BONDS

CHEMICAL BONDS



CHEMICAL BONDS

HYDROGEN BONDS

WEAKER THAN

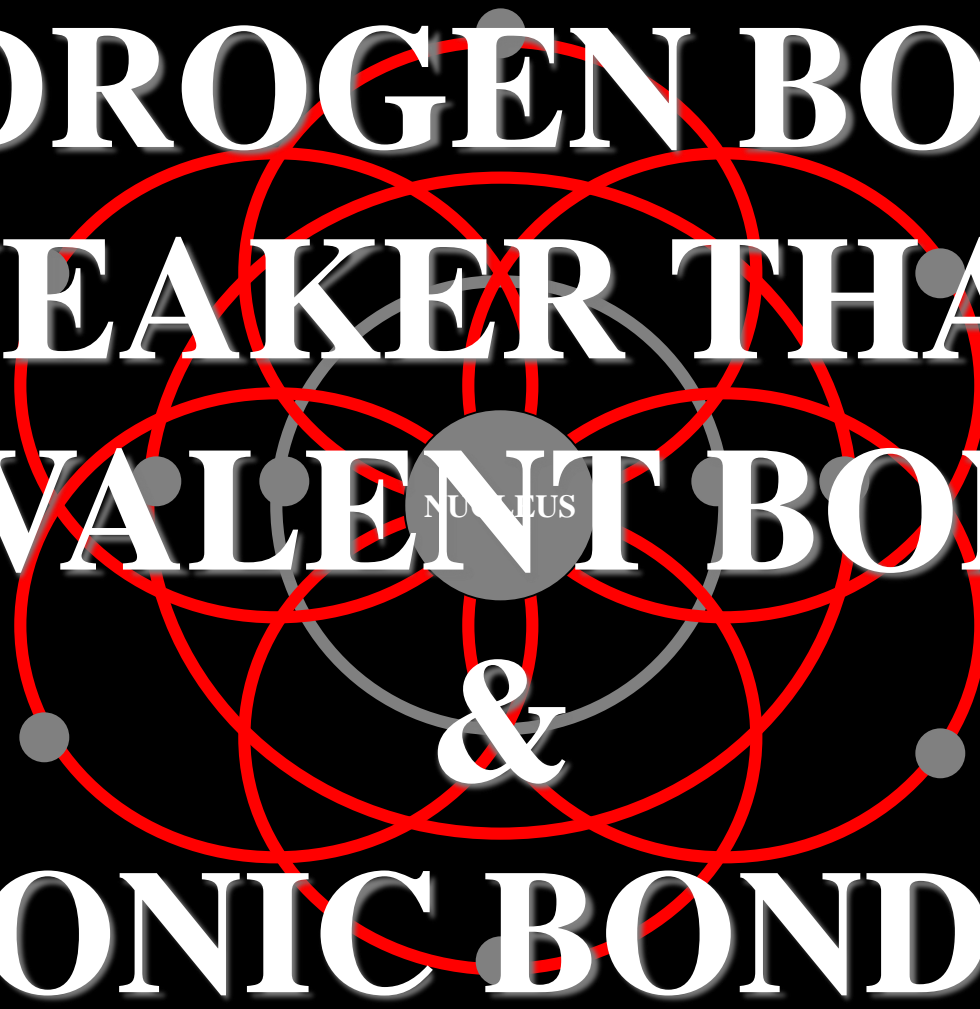
COVALENT BONDS

NUCLEUS

&

IONIC BONDS

CHEMICAL BONDS

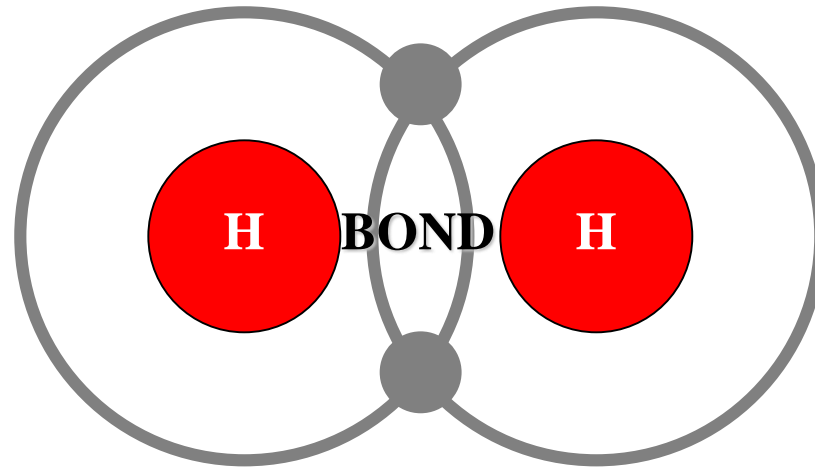


CHEMICAL BOND STRENGTH

CHEMICAL BOND STRENGTH



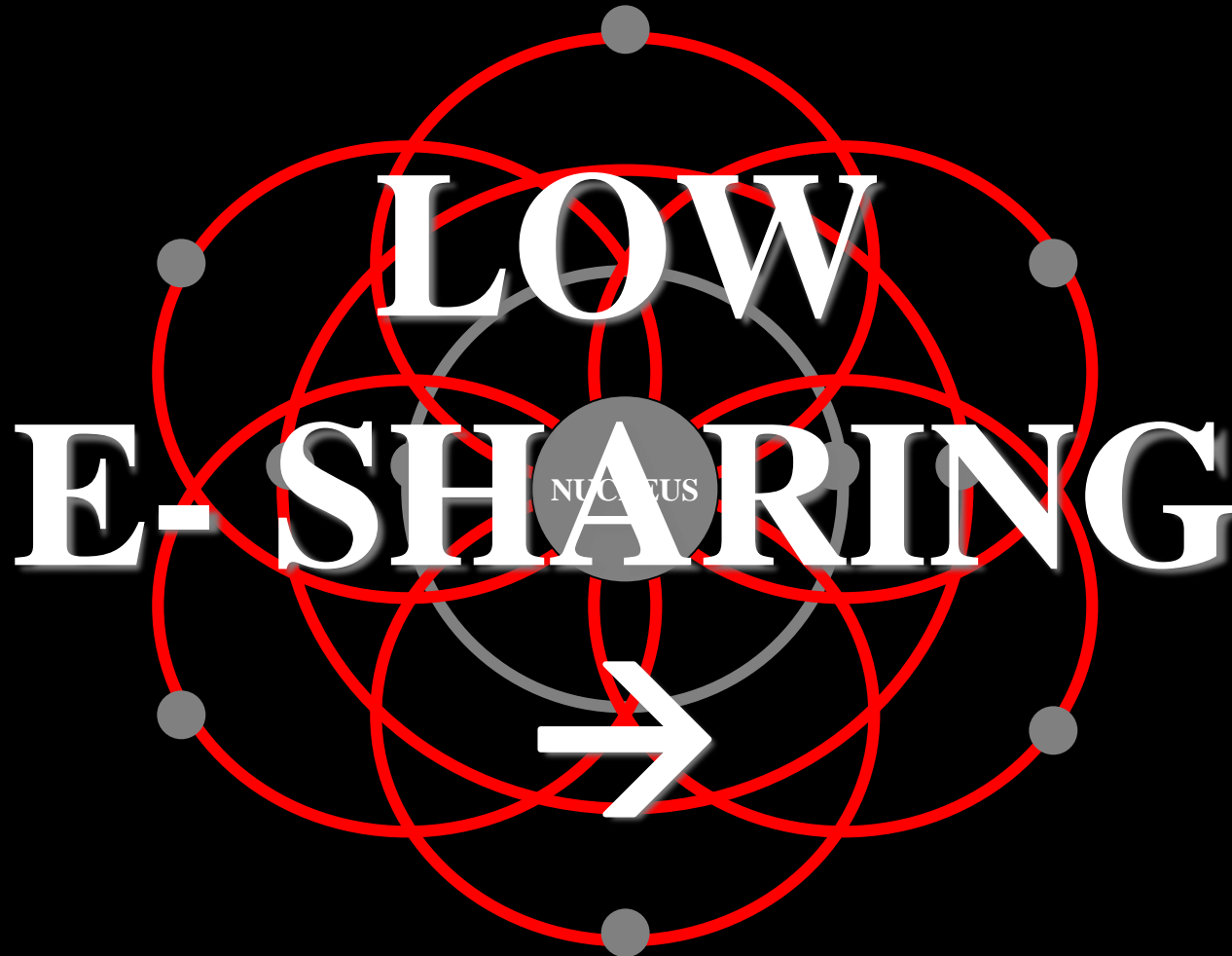
CHEMICAL BOND STRENGTH DETERMINED VIA E- SHARING



● = E-

HYDROGEN MOLECULE

CHEMICAL BOND STRENGTH



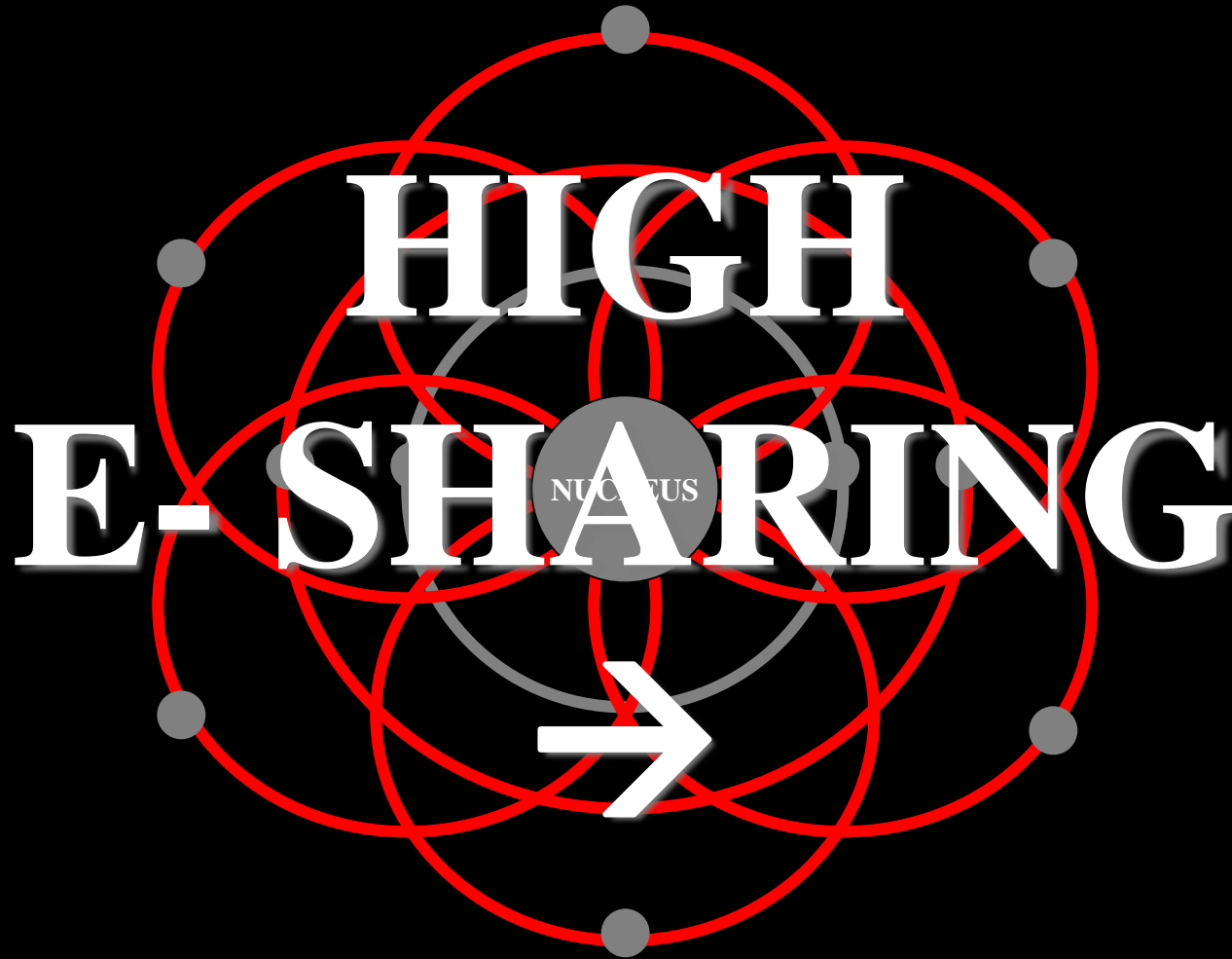
CHEMICAL BOND STRENGTH

CHEMICAL BOND STRENGTH



CHEMICAL BOND STRENGTH

CHEMICAL BOND STRENGTH



CHEMICAL BOND STRENGTH

CHEMICAL BOND STRENGTH



CHEMICAL BOND STRENGTH



CHEMICAL BOND STRENGTH SUMMARY

CHEMICAL BONDS

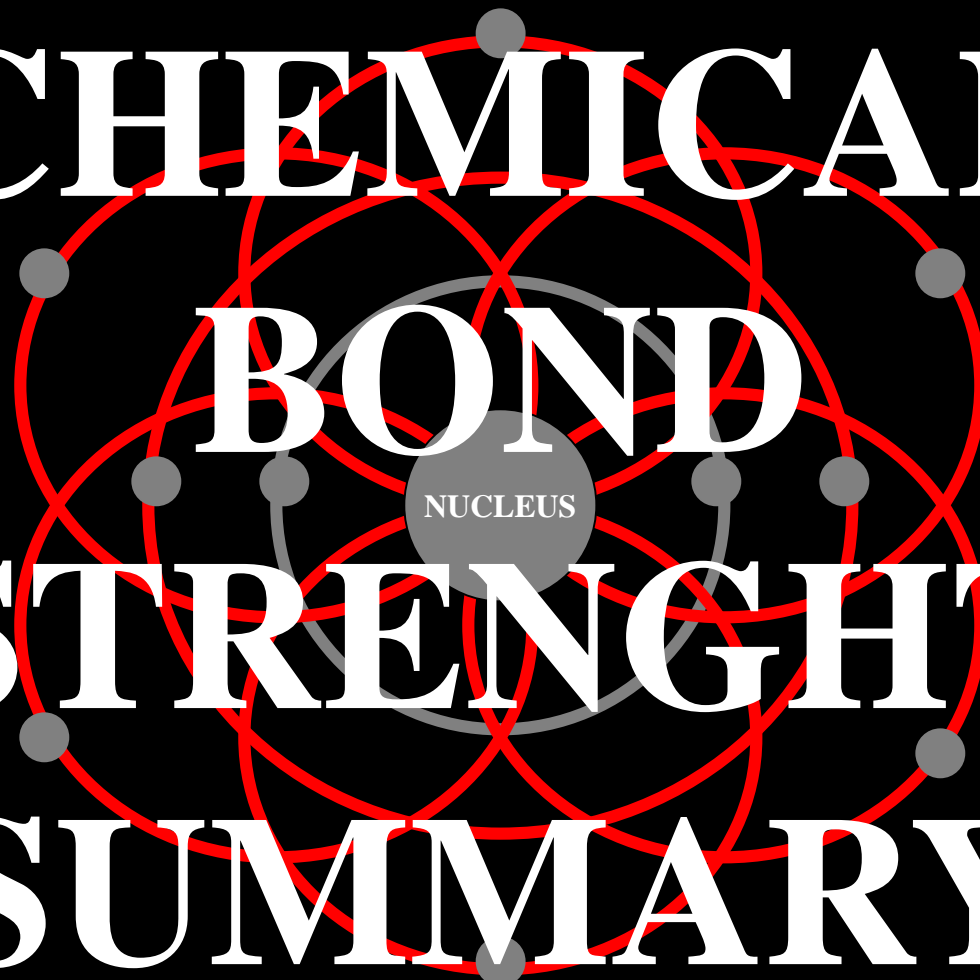
CHEMICAL

BOND

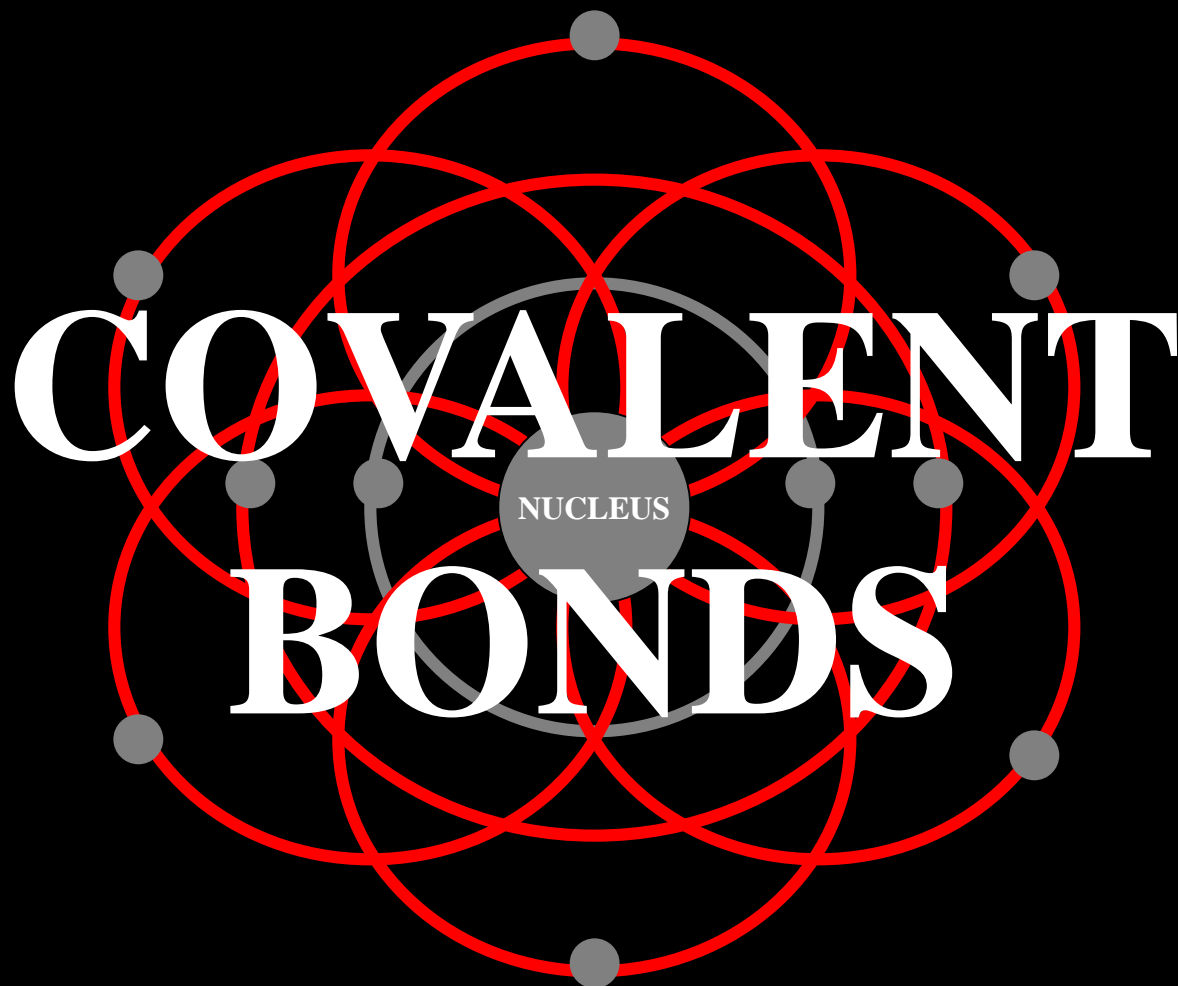
STRENGTH

SUMMARY

CHEMICAL BONDS



CHEMICAL BONDS



CHEMICAL BONDS

CHEMICAL BONDS



NON-POLAR COVALENT BONDS

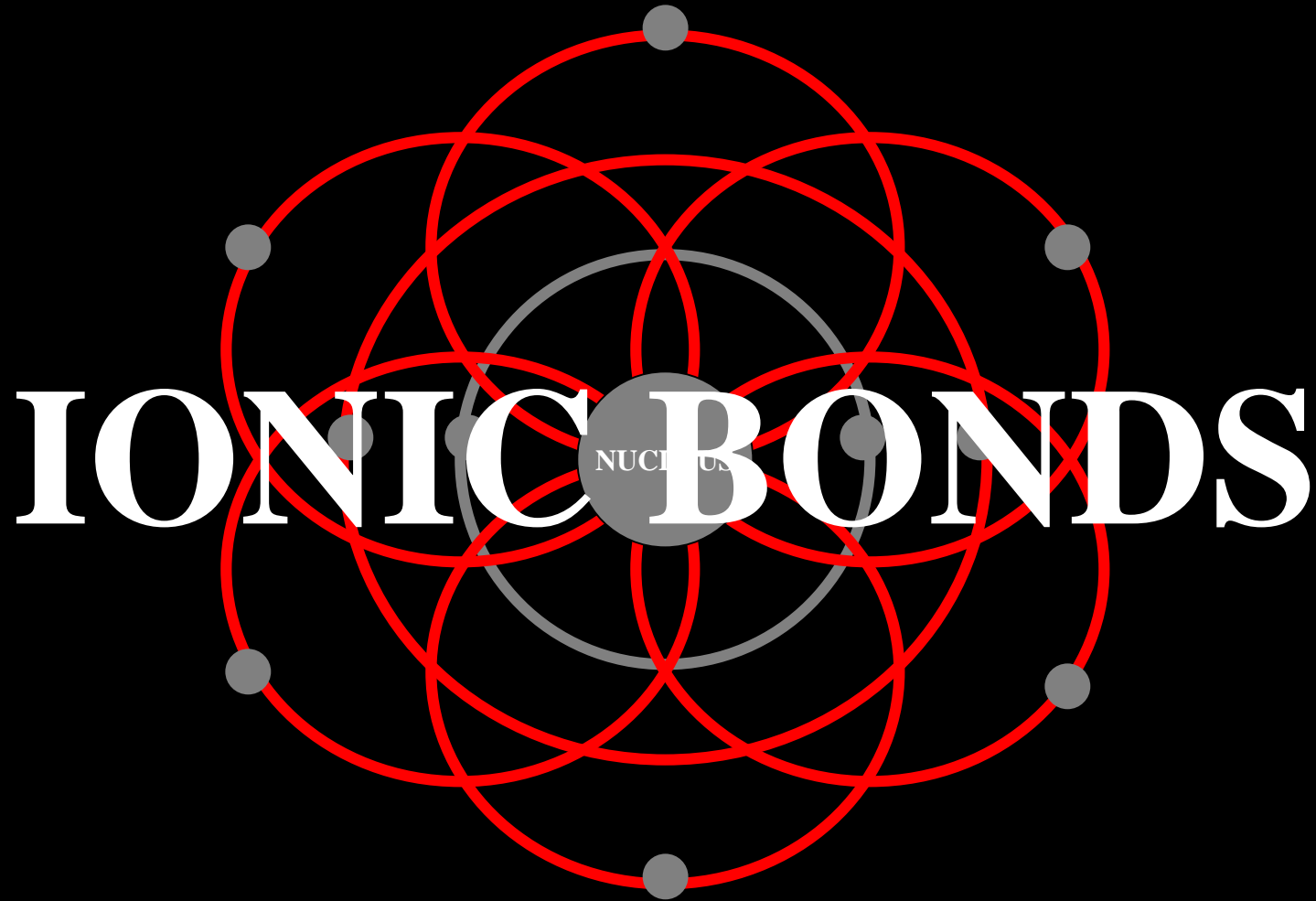
CHEMICAL BONDS

CHEMICAL BONDS



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CHEMICAL BONDS



CHEMICAL BONDS

BIOCHEMICAL PATHWAYS

BIOCHEMICAL PATHWAY

BIOCHEMICAL PATHWAY

OBLIGATE SERIES
BIOCHEMICAL
REACTIONS

BIOCHEMICAL PATHWAY



BIOCHEMICAL
PATHWAY
EXAMPLE
GLYCOLYSIS

GLYCOLYSIS

GLUCOSE

GLYCOLYSIS

HEXOKINASE

ATP

ENERGY

ADP

GLUCOSE-6-PHOSPHATE

PHOSPHOGLUCOISOMERASE

FRUCTOSE-6-PHOSPHATE

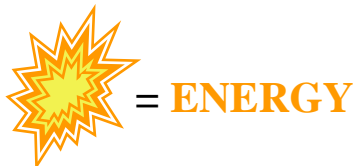
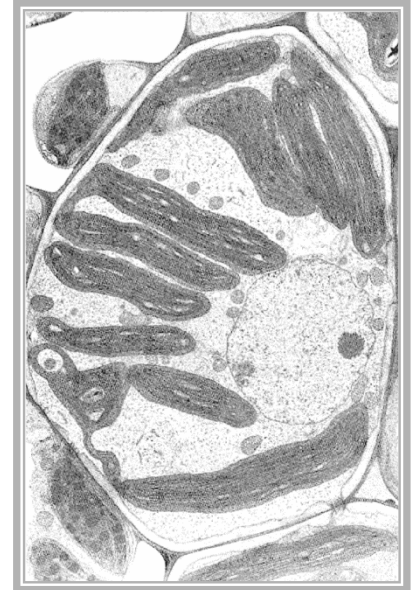
PHOSPHOFRUCTOKINASE

ATP

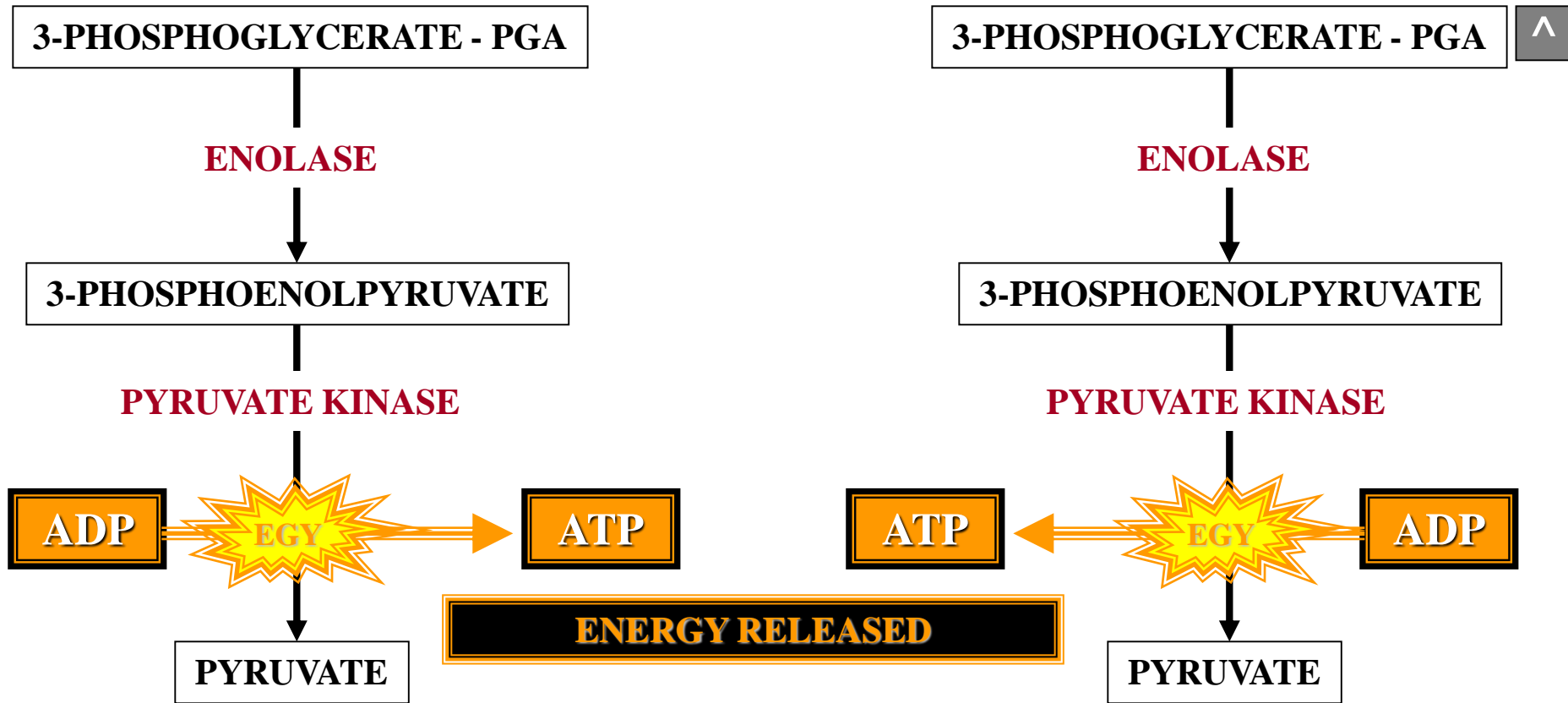
ENERGY

ADP

FRUCTOSE-1-6-PHOSPHATE



+



**BIOCHEMICAL PATHWAY
OBLIGATE SERIES
BIOCHEMICAL REACTIONS**

BIOCHEMICAL REACTIONS

BIOCHEMICAL REACTION

BIOCHEMICAL REACTION



INVOLVES

BREAKING & FORMING
CHEMICAL BONDS

BIOCHEMICAL REACTION

CHEMICAL BOND TYPES

COVALENT BONDS

IONIC BONDS

HYDROGEN BONDS

CHEMICAL BOND TYPES



BIOCHEMICAL REACTION EXAMPLE

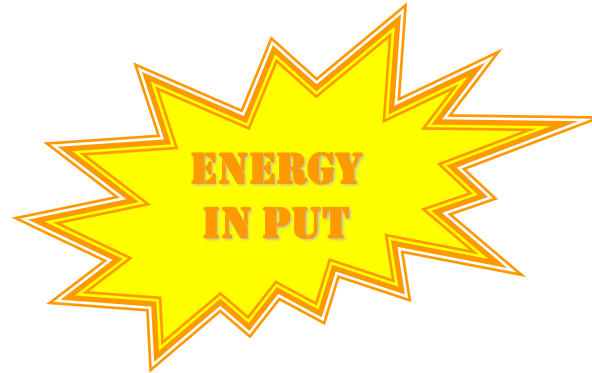
BIOCHEMICAL REACTION



CMP-A + CMP-B



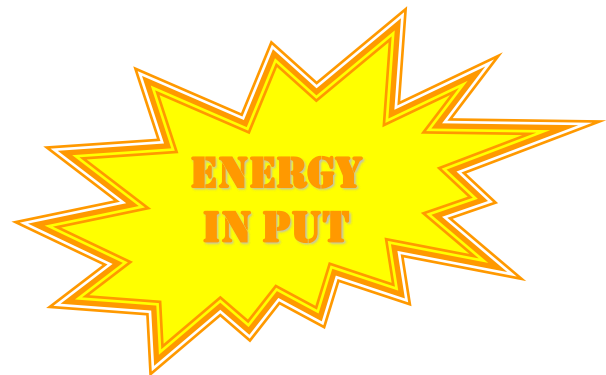
BIOCHEMICAL REACTION



BIOCHEMICAL REACTION



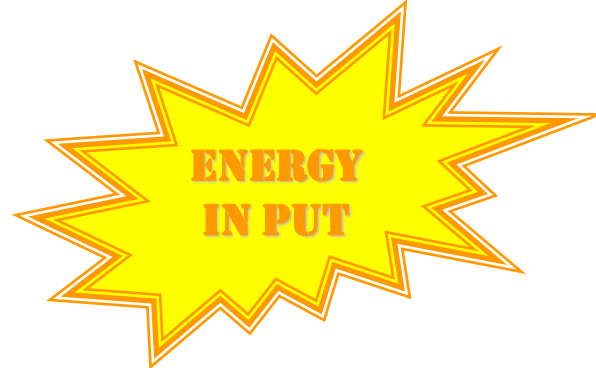
BIOCHEMICAL REACTION



LEFT



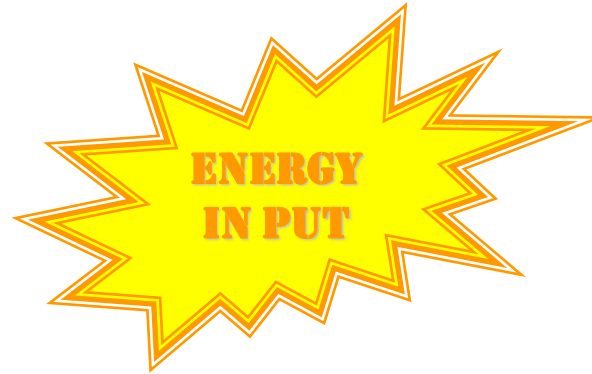
BIOCHEMICAL REACTION



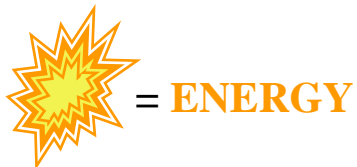
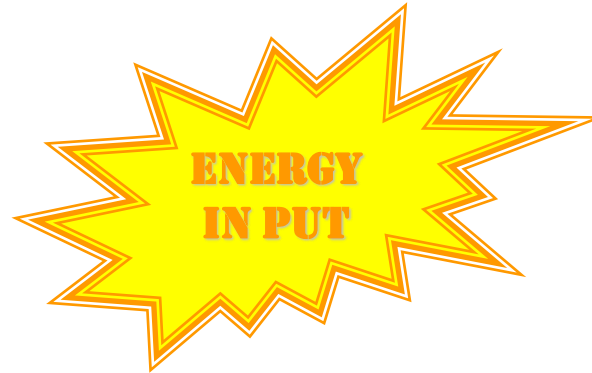
REACTANT(S)



BIOCHEMICAL REACTION



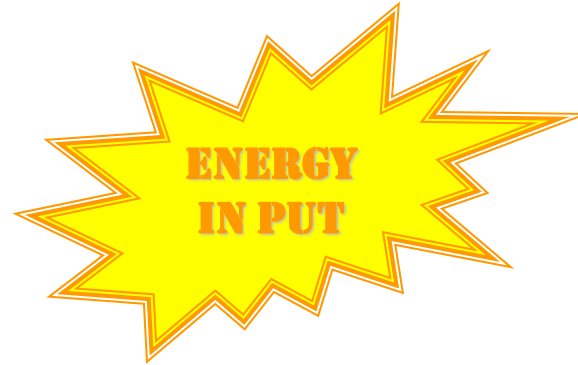
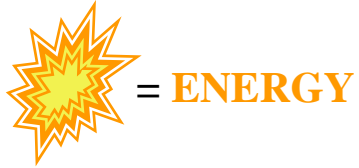
BIOCHEMICAL REACTION





BIOCHEMICAL REACTIONS REQUIRE

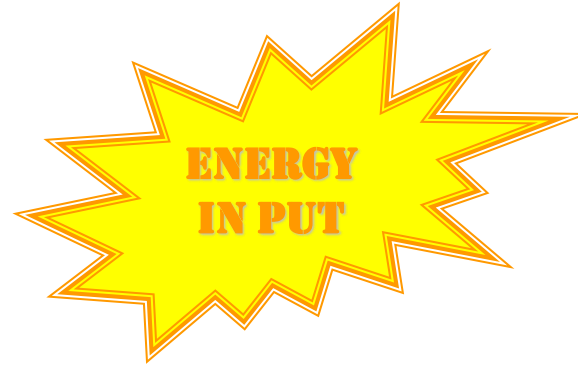
BIOCHEMICAL REACTION



REACTANT(S)

PRODUCT(S)

BIOCHEMICAL REACTION



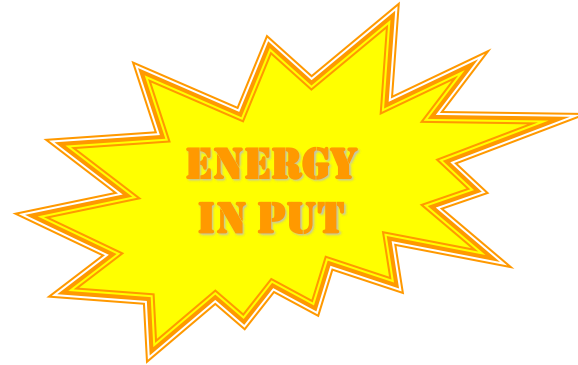
REACTANT(S)

PRODUCT(S)

REACTANTS

COLLIDE CORRECTLY ALIGNED

BIOCHEMICAL REACTION



REACTANT(S)


PRODUCT(S)

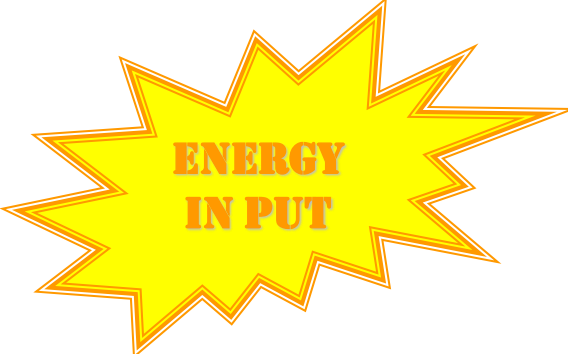
REACTANTS

COLLIDE SUFFICIENT ENERGY



BIOCHEMICAL REACTION

 = ENERGY

 ENERGY
IN PUT



REACTANT(S)

PRODUCT(S)

ACTIVATION ENERGY

ACTIVATION ENERGY

ACTIVATION ENERGY



ACTIVATION ENERGY

**MINIMUM REQUIRED
REACTION ENERGY**

ACTIVATION ENERGY