

Ion Charges

Ions Formed based on Periodic Group

Group	Val e ⁻	Charge	Group	Val e ⁻	Charge	Group	Val e ⁻	Charge
1A (1)	1	1+	3A (13)	3	3+	6A (16)	6	2-
2A (2)	2	2+	4A (14)	4	4+ / 4-	7A (17)	7	1-
1B – 10B (3 – 12)	2 (Varies)	Varies	5A (15)	5	3-	8A (18)	8	No Charge

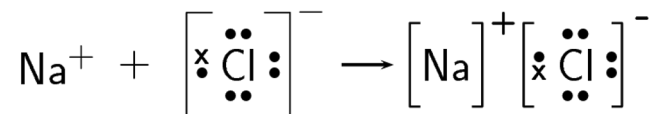
Roman Numerals

1	2	3	4	5	6	7	8
I	II	III	IV	V	VI	VII	VIII

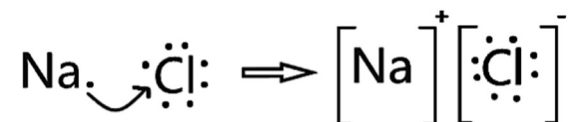
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Ionic Bond w/ Lewis Dot Structures

Metal (1 – 3 valence e⁻) transfer electrons to Non-Metal (5 – 7 valence e⁻)



Sodium (Na) transfers an electron to chlorine (Cl) – Na¹⁺ and Cl¹⁻ – NaCl



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Lewis Dot Structures

1A/1	2A/2	3A/13	4A/14	5A/15	6A/16	7A/17	8A/18
1 val e ⁻	2 val e ⁻	3 val e ⁻	4 val e ⁻	5 val e ⁻	6 val e ⁻	7 val e ⁻	8 val e ⁻
$\cdot \text{X}$	$\cdot \text{X} \cdot$	$\cdot \text{X} \cdot$	$\cdot \text{X} \cdot$	$\cdot \text{X} \cdot$	$\cdot \text{X} \cdot$	$\cdot \text{X} \cdot$	$\cdot \text{X} \cdot$
+1	+2	+3	+4	-3	-2	-1	0
$[\text{X}]^{1+}$	$[\text{X}]^{2+}$	$[\text{X}]^{3+}$	$[\text{X}]^{4+}$	$[\text{X}]^{3-}$	$[\text{X}]^{2-}$	$[\text{X}]^{1-}$	$[\text{X}]$

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Ionic Nomenclature

Naming Ionic Compounds

Naming Format

Representative Metals
(1A, 2A, Al, Si)

Transition Metals
(1B – 10B, 3A [In, Tl] 4A [Pb, Sn])

Metal + Non-Metal –ide Metal (Charge) Non-Metal –ide

Roman Numerals

1	2	3	4	5	6	7	8
I	II	III	IV	V	VI	VII	VIII

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Anion Non-Metal Endings

-ide Non-Metal Endings

Atomic Number	Element Name	Ion Name	Atomic Number	Element Name	Ion Name
6	Carbon	Carbide	16	Sulfur	Sulfide
7	Nitrogen	Nitride	17	Chlorine	Chloride
8	Oxygen	Oxide	34	Selenium	Selenide
9	Fluorine	Fluoride	35	Bromine	Bromide
15	Phosphorous	Phosphide	53	Iodine	Iodide

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Elements with Different Names/Symbols

The following element names don't match symbol

#	Symbol	Element	#	Symbol	Element
11	Na	Sodium	51	Sb	Antimony
19	K	Potassium	74	W	Tungsten
26	Fe	Iron	79	Au	Gold
29	Cu	Copper	80	Hg	Mercury
47	Ag	Silver	82	Pb	Lead
50	Sn	Tin	85	At	Astatine

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Polyatomic Ion Chart

The following is a list of common polyatomic ions

Polyatomic Ion	Ion Formula	Polyatomic Ion	Ion Formula	Polyatomic Ion	Ion Formula
Ammonium	NH_4^{1+}	Hydronium	H_3O^{1+}	Carbonate	CO_3^{2-}
Nitrate	NO_3^{1-}	Cyanide	CN^{1-}	Sulfate	SO_4^{2-}
Fluorate	FO_3^{1-}	Hydroxide	OH^{1-}	Chromate	CrO_4^{2-}
Chlorate	ClO_3^{1-}	Acetate	$\text{C}_2\text{H}_3\text{O}_2^{1-}$	Dichromate	$\text{Cr}_2\text{O}_7^{2-}$
Bromate	BrO_3^{1-}	Permanganate	MnO_4^{1-}	Oxalate	$\text{C}_2\text{O}_4^{2-}$
Iodate	IO_3^{1-}	Bicarbonate	HCO_3^{1-}	Phosphate	PO_4^{3-}

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Polyatomic Ion Conjugations

Some polyatomic ions can be changed by change number of oxygens

-ate (Base)	Ion Formula	-ite (-1 oxy)	Ion Formula	per__ite (+1 oxy)	Ion Formula
Chlorate	ClO_3^{1-}	Chlorite	ClO_2^{1-}	Perchlorate	ClO_4^{1-}
Bromate	BrO_3^{1-}	Bromite	BrO_2^{1-}	Perbromate	BrO_4^{1-}
Nitrate	NO_3^{1-}	Nitrite	NO_2^{1-}		
Carbonate	CO_3^{2-}	Carbonite	CO_2^{2-}		
Sulfate	SO_4^{2-}	Sulfite	SO_3^{2-}		
Phosphate	PO_4^{3-}	Phosphite	PO_3^{3-}		

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