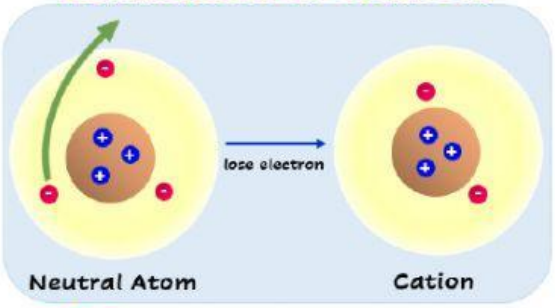
Name: _____ Date: _____

Ions (Cation and Anion)

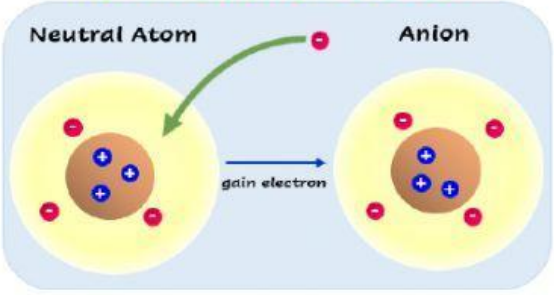
A neutral atom has the same number of protons and electrons. It has neither a positive nor a negative charge. When an atom loses or gains one or more electrons, it acquires a net electrical charge and it is called an ion. The charge of an ion depends on what happened to electrons. If electrons are gained, the charge is negative since there are more electrons than protons. If electrons are lost, the charge is positive since there are more protons than electrons.

Formation of CATION



A **cation** has more protons than electrons. It has a positive net charge.

Formation of ANION



An **anion** has more electrons than protons, consequently giving it a net negative charge.

1. Which subatomic particle carries a positive charge? _____

2. Which subatomic particle carries a negative charge? _____

3. What do you call an atom with the same number of protons and electrons?

_____

4. How to get the charge of an ion from the number of protons and electrons in an ion. Complete these mathematical equation:

no. of _____ - number of _____ = the charge of an ion

5. What type of ions have more electrons than protons? _____

6. What type of ions have lesser electrons than protons? _____

7. What ion is generated when an atom losses an electron? _____

8. What ion is generated when an atom gains an electron? _____

Ion Charges/Ionic State of Selected Elements

Alkali Metals IA	Alkaline Metals IIA					TRANSITION METALS						Boron Group IIIA	Carbon Group IVA	Nitrogen Group VA	Oxygen Group VIA	Halogen Group VIIA	Noble Gas VIIIA
		IIIB	IVB	VB	VIB	VIIB	VIIIB	VIIIB	VIIIB	IB	IIB						
1 H^+	4 Be^{2+}											5 B	6 C	7 N^{3-}	8 O^{2-}	9 F^-	2 He
3 Li^+	12 Mg^{2+}											13 Al^{3+}	14 Si	15 P^{3-}	16 S^{2-}	17 Cl^-	10 Ne
11 Na^+	20 Ca^{2+}	21 Sc^{3+}	22 Ti^{3+} Ti^{4+}	23 V^{3+} V^{5+}	24 Cr^{2+} Cr^{3+}	25 Mn^{2+} Mn^{4+}	26 Fe^{2+} Fe^{3+}	27 Co^{2+} Co^{3+}	28 Ni^{2+} Ni^{3+}	29 Cu^+ $Cu2^+$	30 Zn^{2+}	31 Ga^{3+}	32 Ge^{4+}	33 As^{3-}	34 Se^{2-}	35 Br^-	18 Ar
19 K^+	38 Sr^{2+}	39 Y^{3+}	40 Zr^{4+}	41 Nb^{3+} Nb^{5+}	42 Mo^{6+}	43 Tc^{7+}	44 Ru^{3+} Ru^{4+}	45 Rh^{3+}	46 Pd^{2+} Pd^{4+}	47 Ag^+	48 Cd^{2+}	49 In^{3+}	50 Pb^{2+} Pb^{4+}	51 Sb^{3+} Sb^{5+}	52 Te^{2-}	53 I^-	36 Kr
37 Rb^+	56 Ba^{2+}	71 Lu^{3+}	72 Hf^{4+}	73 Ta^{5+}	74 W^{6+}	75 Re^{7+}	76 Os^{4+}	77 Ir^{4+}	78 Pt^{2+} Pt^{4+}	79 Au^+ $Au3^+$	80 Hg^{2+} Hg^{3+}	81 Tl^+ Tl^{3+}	82 Sn^{2+} Sn^{4+}	83 Bi^{3+} Bi^{5+}	84 Po^{2+} Po^{4+}	85 At^-	54 Xe
55 Cs^+	88 Ra^{2+}	87 Fr^+															86 Rn

CATIONS → ← ANIONS

Using the Ion Charges/Ionic State of Selected Elements above. Identify the number of protons, electrons of the following ions:

O^{2-}
No. of proton: _____
No. of electrons: _____

N^{3-}
No. of proton: _____
No. of electrons: _____

Ga^{3+}
No. of proton: _____
No. of electrons: _____

Cl^-
No. of proton: _____
No. of electrons: _____

Ca^{2+}
No. of proton: _____
No. of electrons: _____

Rb^+
No. of proton: _____
No. of electrons: _____

/Malord1971