Atom Properties & Forces

Name: Key 2019
Date: _____ Period: _____

Part 1: Atom Properties. *Fill in the blanks for the elements listed below.*

Element	Element Symbol	Number of Protons	Number of Neutrons	Number of Electrons	Mass Number	Atomic Number	Symbol w/ AN and MN
Sodium	Na	11	12	11	23	11	$^{23}_{11}Na$
Calcium	Ca	20	20	20	40	20	$^{40}_{20}Ca$
Nitrogen	N	7	6	7	13	7	$^{13}_{7}N$
Neon	Ne	10	10	10	20	10	$^{20}_{10}Ne$
Oxygen	O	8	8	10	16	8	O^{-2}
Copper	Cu	29	35	29	64	29	$^{64}_{29}Cu$
Fluorine	F	9	10	9	19	9	$^{19}_{9}F$
Aluminum	Al	13	14	10	27	13	$^{27}_{13}Al^{+3}$

Part 2: Isotopes. *Fill in the blanks for the elements listed below. Remember not to change atomic number or number of protons for atoms of the same element!!*

Element	Number of Protons	Number of Neutrons	Number of Electrons	Mass Number	Atomic Number	Symbol w/ AN and MN
Carbon-12	6	6	6	12	6	$^{12}_{6}C$
Carbon-13	6	7	6	13	6	$^{13}_{6}C$
Carbon-14	6	8	6	14	6	$^{14}_{6}C$
Chlorine-35	17	18	17	35	17	$^{35}_{17}Cl$
Chlorine-37	17	20	17	37	17	$^{37}_{17}Cl$
Argon-36	18	18	17	36	18	$^{36}_{18}Ar$
Argon-38	18	20	18	38	18	$^{38}_{18}Ar$
Argon-40	18	22	18	40	18	$^{40}_{18}Ar$

Atomic Forces
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1. Describe the force that keeps the electrons from leaving the atom.

Electric Force keeps the e^- from leaving the atom.
- acts between charged particles, in this case p^+ & e^- (opposites attract)
- The nucleus of the atom is positive & attracts the negatively charged electrons.

2. Describe the force which keeps the nucleons bound together.

The strong force holds the p^+ & n^0 together in the nucleus. It is 100 x stronger than the electric force & is extremely short-range. The strong force attracts p^+ & p^+, n^0 & n^0, and p^+ & n^0

3. If the electromagnetic force is not strong enough to keep electrons in the cloud, what happens as a result?

If the electric force isn't strong enough to keep the e^- in the cloud, e^- may be lost. This forms a positive ion.

4. If the strong nuclear force is not strong enough to keep the nucleons together, what happens as a result?

If the strong nuclear force isn't strong enough to keep the nucleons together, the nucleus will be unstable & break down (decay).