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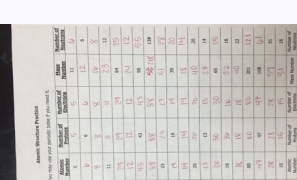
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Name _____ Period _____ Date _____

ISOTOPES, IONS, AND ATOMS WORKSHEET

Atomic # = # of protons. Mass # = Atomic # + neutrons. Protons = electrons when charge is zero.

Atomic #	Mass #	# p ⁺	# e ⁻	# n ⁰	charge	Symbol
1) 17				19	0	
2)	180		71	109		
3)		40	38	46		
4) 92	238		86			
5)						²⁰⁶ ₈₂ Pb ⁴⁺
6)		34		45	-2	
7)	113	48	49			
8) 21	42				0	
9)						³¹ ₁₅ P ³⁺
10)		83	80	126		
11)						¹⁰⁸ ₄₇ Ag
12)	116	49			+3	
13)	128	53			-1	
14) 76	188		72			



Ion	Chemical Symbol	Number of Protons	Number of Neutrons	Number of Electrons	Atomic Number	Mass Number	Electron Diagram	Electron Configuration
lithium	Li ⁺	3	3	2	3	6		1s ²
carbon	C ⁴⁺	6	6	2	6	12		1s ²
nitrogen	N ³⁻	7	7	10	7	14		1s ² 2s ² 2p ⁶
oxygen	O ²⁻	8	8	10	8	16		1s ² 2s ² 2p ⁶
fluorine	F ⁻	9	9	10	9	18		1s ² 2s ² 2p ⁶
neon	Ne	10	10	10	10	20		1s ² 2s ² 2p ⁶
sodium	Na ⁺	11	11	10	11	23		1s ² 2s ² 2p ⁶
magnesium	Mg ²⁺	12	12	10	12	24		1s ² 2s ² 2p ⁶
aluminum	Al ³⁺	13	13	10	13	27		1s ² 2s ² 2p ⁶

Teacher Notes

Name Key Class _____ Date _____

Atomic Structure

Subatomic Particles in Neutral Atoms

The table below contains information about several isotopes. Use the information given to fill in the blanks. Assume all atoms are neutral.

Isotope Name	Nuclear Symbol	Atomic Number	Mass Number	# of Protons	# of Neutrons	# of Electrons
1. calcium-40	⁴⁰ ₂₀ Ca	20	40	20	20	20
2. iron-56	⁵⁶ ₂₆ Fe	26	56	26	30	26
3. oxygen-18	¹⁸ ₈ O	8	18	8	10	8
4. gold-197	¹⁹⁷ ₇₉ Au	79	197	79	118	79

Subatomic Particles in Ions

The table below contains information about several ions. Use the information given to fill in the blanks.

Element Name	Ion Symbol	Atomic Number	Mass Number	# of Protons	# of Neutrons	# of Electrons
5. chlorine	Cl	17	35	17	18	18
6. silver	Ag ⁺	47	107	47	60	46
7. oxygen	O ²⁻	8	16	8	8	10
8. aluminum	Al ³⁺	13	27	13	14	10

Average Atomic Mass

9. Calculate the average atomic mass for neon if its abundance in nature is 90.5% neon-20, 0.3% neon-21, and 9.2% neon-22.

$$\frac{(90.5)(20 \text{ amu}) + (0.3)(21 \text{ amu}) + (9.2)(22 \text{ amu})}{100} = 20.18 \text{ amu}$$

10. Calculate the average atomic mass of silver if 13 out of 25 atoms are silver-107 and 12 out of 25 atoms are silver-109.

$$\frac{(13)(107 \text{ amu}) + (12)(109 \text{ amu})}{25} = 107.96 \text{ amu}$$

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