

## Final Exam Review - 271

### Unit 1 Atomic Structure Terms:

mass number	neutron	sublevels	average atomic mass
atomic number	electrons	orbitals	valence electrons
proton	ion	isotopes	kernel electrons

1. What is the mass, charge and location of an electron, proton and neutron?

	<b>Mass</b>	<b>Charge</b>	<b>Location</b>
proton	1 amu	positive	nucleus
neutron	1 amu	neutral	nucleus
electron	0 amu	negative	outside nucleus

2. Assume these are all **neutral atoms**.

Element	Atomic #	Mass #	Neutrons	Electrons
Ar	18	38	20	18
Rb	37	72	35	37
Si	14	29	15	14
Na	11	22	11	11

3. List the number of protons, neutrons and electrons for the following ions.

Element	Protons	Neutrons	Electrons
${}_{12}^{25}\text{Mg}^{2+}$	12	13	10
${}_{8}^{17}\text{O}^{2-}$	8	9	10

4. Neon has 2 isotopes. Neon-20 has a mass of 19.992 u and neon-22 has a mass of 21.991 u. In any sample of 100 neon atoms, 90 will be neon-20 and 10 will be neon-22. What is the average atomic mass of neon?

	<b>Mass</b>	<b>% Abundance</b>			
Neon - 20	19.992	x 90	=	17.9928	
Neon - 22	21.991	x 10	=	+ 2.1991	
				<u>20.1919 u</u>	

5. What is the average atomic mass of silicon if 92.21 % of its atoms have mass 27.97 u, 4.70% have mass 28.976 u, and 3.09 % have mass 29.974 u?

	<b>Mass</b>	<b>% Abundance</b>			
Si -	27.97	x 92.21	=	25.79	
Si -	28.976	x 4.70	=	1.362	
Si -	29.974	x 3.09	= +	<u>.9262</u>	
				28.08 u	

6. What were some problems with Dalton's Atomic Theory? **Solid mass, no isotopes**

7. What did Rutherford's experiment prove? **The existence of a positively charged nucleus.**