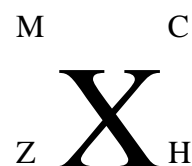


# V. Atomic Structure Problems

0. As far as we are concerned in this course, 99.99% of the matter in the universe is composed of three subatomic particles. What are the names and charges of these particles? Where in the atom do these particles exist?

1. Given the elemental symbol X shown below, what do Z, M, C, and H stand for?



2. How many  $p^+$ ,  $n$ , and  $e^-$  are present in each of the following, and would you expect the indicated material to be stable? (See Supplemental Information part of the web page for a Periodic Table.)

	$p^+$	$n$	$e^-$	stable???
${}^6\text{Li}$	_____	_____	_____	_____
${}^{81}\text{Br}^-$	_____	_____	_____	_____
${}^{196}\text{Pt}$	_____	_____	_____	_____
${}^{41}\text{Ar}$	_____	_____	_____	_____
${}^{90}\text{Sr}^{2+}$	_____	_____	_____	_____

3. Describe the number, shape, and relative size of:

a)  $4s$  atomic orbitals

b)  $3p$  atomic orbitals

4. Define the term *valence electron*.

5. Write electron configurations for and circle the valence electrons in:

a) N

b) Kr

c)  $\text{Cl}^-$

d)  $\text{Ca}^{2+}$

6. Comment on the stability of 5a)-d).