

Show All Work to Receive Credit.

1. (8 Pts) Complete the following table:

| Element or ion name          | Element or ion symbol (and charge if needed). | Number of Protons | Number of Electrons | Number of Neutrons |
|------------------------------|-----------------------------------------------|-------------------|---------------------|--------------------|
| Phosphorous-31               | P                                             | 15                | 15                  | 16                 |
| Iron-56                      | Fe                                            | 26                | 26                  | $56 - 26 = 30$     |
| A potassium-40 <u>cation</u> | $K^{1+}$                                      | 19                | 18                  | $40 - 19 = 21$     |
| An iodine-129 <u>anion</u>   | $I^{1-}$                                      | 53                | 54                  | $129 - 53 = 76$    |

2. (6 Pts) Determine which ELEMENT OR ION in each pair has a larger volume (diameter) and EXPLAIN YOUR REASONING.

- a. A Rb atom or a  $Rb^{+}$  ion? Larger Rb atom Reason: They each have the same number of protons, but the Rb atom has one more electron.
- b. An Al atom or a Cl atom? Larger Al Reason: They have the same number of shells, but Al has less protons.
- c. A Po atom or a Te atom? Larger Po Reason: Po has more shells.

3. (5 Pts) What volume of bromine (density = 2.928 g/mL at 20°C) is needed to provide 58.5 grams of bromine?

$$\frac{58.5g}{2.928g/mL} = 19.98 mL \Rightarrow \boxed{20.0 mL}$$

4. (3 Pts) Describe what would happen on the electronic level in a chemical reaction between a metal and a non-metal. (What happens between the electrons?)

The metal will lose  $e^{-}(s)$  and the nonmetal will gain  $e^{-}(s)$  forming an ionic bond.

5. (2 Pts) Give the name and symbol for:

A non-metal \_\_\_\_\_ A metal \_\_\_\_\_

6. (1 Pt) What is the mass number of an atom of iodine with 74 neutrons?

$$53 + 74 = \boxed{127}$$