

All work must be shown to receive credit. Avogadro's number $6.022 \times 10^{23}/\text{mol}$

1. (6 points) An unknown element contains 23 protons, 21 electrons, and has a mass number of 52. Answer the following questions.

a. What is the atomic number of this element?

23

b. What is the name of this element?

vanadium

c. How many neutrons does this element contain?

$52 - 23 = 29$ neutrons

2. (4 points) In what ways are isotopes alike?

Same number of protons

Same chemical and physical properties except for mass

In what ways are they different?

Different numbers of neutrons

Different masses

3. (4 points) Give the correct name or formula for the following compounds

IUPAC Name	Formula
Copper(II) hypochlorite	$\text{Cu}(\text{ClO})_2$
Calcium phosphate	$\text{Ca}_3(\text{PO}_4)_2$
Sodium carbonate	Na_2CO_3
Nickel(II) nitrite	$\text{Ni}(\text{NO}_2)_2$

4. (3 points) Calculate the number of moles of copper that contain 8.34×10^{21} atoms of copper

$$? \text{ mol Cu} = 8.34 \times 10^{21} \text{ atoms Cu} \times \frac{1 \text{ mol Cu}}{6.022 \times 10^{23} \text{ atoms Cu}} = 0.0138 \text{ mol Cu}$$

5. (3 points) Calculate the mass of 3.87 moles of platinum.

$$? \text{ g Pt} = 3.87 \text{ mol Pt} \times \frac{195.1 \text{ g Pt}}{1 \text{ mol Pt}} = 755 \text{ g Pt}$$

March 3, 2009

All work must be shown to receive credit. Avogadro's number $6.022 \times 10^{23}/\text{mol}$

1. (6 points) An unknown element contains 25 protons, 23 electrons, and has a mass number of 56. Answer the following questions.

a. What is the atomic number of this element?

25

b. What is the name of this element?

manganese

c. How many neutrons does this element contain?

$56 - 25 = 31$ neutrons

2. (4 points) In what ways are isotopes alike?

Same number of protons

Same chemical and physical properties except for mass

In what ways are they different?

Different numbers of neutrons

Different masses

3. (4 points) Give the correct name or formula for the following compounds

IUPAC Name	Formula
cobalt(II) perchlorate	$\text{Co}(\text{ClO}_4)_2$
Barium phosphate	$\text{Ba}_3(\text{PO}_4)_2$
Potassium carbonate	K_2CO_3
Iron(II) nitrite	$\text{Fe}(\text{NO}_2)_2$

4. (3 points) Calculate the number of moles of copper that contain 5.23×10^{21} molecules of copper

$$? \text{ mol Cu} = 5.23 \times 10^{21} \text{ atoms Cu} \times \frac{1 \text{ mol Cu}}{6.022 \times 10^{23} \text{ atoms Cu}} = 0.00868 \text{ mol Cu}$$

5. (3 points) Calculate the mass of 5.22 moles of platinum.

$$? \text{ g Pt} = 5.22 \text{ mol Pt} \times \frac{195.1 \text{ g Pt}}{1 \text{ mol Pt}} = 1020 \text{ g Pt}$$