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Revision worksheet

Chapter-4. Structure of the atom

SUBJECT: Science (Chemistry)

CLASS: IX

Q1. What do you understand by valence shell and valence electrons?

Q2.Fill in the blanks:

i.

No. of protons	**No. of neutrons**	**Mass number**	**Atomic no.**	**Valency**	**Symbol of elements**
8	8	-	-	-	-

ii.

Mass number	**Atomic no.**	**No. of protons**	**No. of neutrons**	**Valency**	**Symbol**
14	7	-	-	-	-

Q3.An isotope of lead has a mass number 211 and atomic number 82($_{82}^{211}$Pb). During radioactive disintegration, it gets converted into an element whose mass number remains the same but atomic no. increases by 1.Will the end product be an isobar?

Q4. State the uses of isotopes?

Q5. State the rules for the distribution of electrons in different orbits.

Q6.Draw the electronic structure of sodium, calcium and oxygen.

Q7. Write the valency of carbon, nitrogen, magnesium, sulphur and neon.

Q8.The nuclear composition of two atomic species X and Y is as follows:

	X	**Y**
No. of protons	17	17
No. of neutrons	18	20

What are their (i) atomic no. (ii) mass numbers? What is the relation between these two atomic species? Name the element(s) which they represent.

Q9. Substances from A to E have distribution of electrons, neutrons and protons as follows:

Substances	**Electrons**	**Neutrons**	**Protons**
A	4	4	3
B	8	9	9
C	18	22	18
D	17	20	17
E	17	18	17

Making use of these data find (i) a cation (ii) an anion (iii) a pair of isotopes (iv) An atom of noble gas.

Q10. i.Which fundamental particle is equal in number in Mg^{2+} and Al^{3+} ions?

ii. Atomic no. of nitrogen and oxygen are 7 and 8, respectively. Calculate the total no. of electrons in nitrate (NO_3^{-}) ion.

iii. How many neutrons are present in hydrogen.

Q11. Give reasons:

(a) Isotopes of an element are chemically similar

(b) An atom is electrically neutral

(c) Noble gases show least reactivity
(d) Nucleus of an atom is heavy and positively charged
(e) Ions are more stable than atoms

Q12. Describe Rutherford's nuclear model of an atom.

Q13.State the new concepts incorporated by Bohr in his proposed model of atom. Draw a diagram to illustrate this model.

Q14.What are the limitations of J.J Thomson's model and Rutherford's model of the atom?

Q15. Differentiate between isotopes and isobars.

Q16.The average atomic mass of copper is 63.5u. It exist as two isotopes which are $^{63}_{29}Cu$ and $^{65}_{29}Cu$. Calculate the percentage of each present in it.

Q17.i. How many electrons, protons and neutrons will be there in an element $^{19}_{9}X$? What will be the valency of this element?

ii.Write three isotopes of hydrogen atom.

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Atoms and molecules:

Q1. Give an example of polyatomic anion and polyatomic cation.
Q2. Out of atoms and molecules which can exist independently?
Q3.What happens to an element 'A' if its atom gains two electrons?
Q4.An element Z forms an oxide with formula Z_2O_3.What is its valency?
Q5.The valency of an element A is 4. Write the formula of its oxide.
Q6. Name the elements in the following compounds:
i.potassium bromide ii. Ammonium sulphate iii. Iron oxide iv.silver iodide
Q7.In a reaction, 4g of sodium carbonate were reacted with 10g of hydrochloric solution. The product was a mixture of 2.5g of carbon-dioxide and 11.5g of sodium chloride solution. Is this data in agreement with the law of conservation of mass?
Q8.Find the simplest ratio of the elements in the following :
i. HCl ii.CaO iii. $MgCl_2$
Q9.Write down the formulae of
i. Aluminium hydroxide ii. Ammonium sulphate iii.Potassium chloride iv. Zinc oxide
Q10. Calculate the molecular mass of the following: i.NH_4OH ii.K_2CO_3 iii. CH_3COOH
Calculate formula mass unit of $CaCl_2$.
Q11.A flask contains 4.4g of CO_2 gas. Calculate
i. How many moles of CO_2 gas does it contain?
ii. How many molecules of CO_2 gas are present in the sample?
iii.How many atoms of oxygen are present in the given sample?
Q12 .i.Calculate the no. of particles in 31g of P_4 molecules.
ii. Find number of moles in 87g of K_2SO_4.
Q13. A sample of vitamin C contains $2.48x10^{25}$ oxygen atoms. How many moles of oxygen atoms are present in the sample?
Q14.Which have more molecules-10g of SO_2 or 10g of O_2 ?
Q15.Calculate the no. of atoms in each of the following:
i. 0.08g of hydrogen ii.0.008g of sulphur iii. 0.8g of iron (Atomic masses:
H=1,S=32,Fe=56) [Ans: i. $4.8176x10^{22}$ atoms ii. $1.505x10^{20}$ atoms iii.$8.6x10^{21}$ atoms]
Q16.i.Calculate the mass of 1molecule of oxygen. [Ans:$5.313x10^{-23}$ g]
ii. Calculate the mass of $3.011x10^{24}$ atoms of carbon.[Ans: 60g]