Valency Chemistry Questions with Solutions

Q1. The combining capacity of an element is known as its
(a) Valency
(b) Oxidation Number
(c) Valence Electron
(d) None of the above
Answer: (a), The combining capacity of an element is known as its valency.

Q2. Which of the following has wholly filled the outermost shell?
(a) Noble Gases
(b) Metals
(c) Nonmetals
(d) None of the above
Answer: (a) Nobel gases have wholly filled the outermost shell.

Q3. Which block do elements not show variable valency?
(a) s block elements
(b) p block elements
(c) d block elements
(d) f block elements
Answer: (a), s block elements not show variable valency.

Q4. Valency generally expresses
(a) Total electrons in an atom
(b) Atomicity of an element
(c) Oxidation Number of an element
(d) Combining capacity of an element
Answer: (d), Valency generally expresses the combining capacity of an element.

Q5. The electrovalency of an element equals the number of electrons lost or gained by an atom during the formation of
(a) Ionic Bond
(b) Covalent Bond
(c) Hydrogen Bond
(d) None of the above
Answer: (a), The electrovalency of an element equals the number of electrons lost or gained by an atom during the formation of an ionic bond.

Q6. What is valency? What is the valency of ferrous and ferric?
Answer: Valency is the combining capacity of an element. It tells about the number of electrons an atom will lose or gain to stabilise itself.
The valency of ferrous is 2, while ferric is 3.

Q7. How can you find the valency of an element?
Answer: The valency of an atom is equivalent to the number of valence electrons if the number of valence electrons is four or less than four. Otherwise, the valency of an element is equivalent to eight minus the number of electrons in the outer shell. If the number of valence electrons is known, we can effortlessly calculate the valency of an element.

Q8. What is covalency?
Answer: Covalency is the maximum number of covalent bonds an atom forms using empty orbitals. It depends on the number of valence electrons of an element.

Q9. What is the valency of chlorine?
Answer: If the valence electrons are less than or equal to 4, then the valency of an element is equal to the number of electrons in the outermost shell. In contrast, if the valence electrons are more than 4, the valency is determined by subtracting the valence electrons from 8.
The electronic configuration of chlorine is 2,8,7.
Thus, it has seven valence electrons. So its valency would be equal to 8 - the number of valence electrons.
I.e. Valency = 8 - Number of valence electrons
Valency = 8 - 7
Valency = 1.
Hence, the valency of chlorine is equivalent to one.

Q10. What is the valency of sulphur?
Answer: If the valence electrons are less than or equal to 4, then the valency of an element is equal to the number of electrons in the outermost shell. In contrast, if the valence electrons are more than 4, the valency is determined by subtracting the valence electrons from 8.
The electronic configuration of magnesium is 2,8,2.
Thus, it has two valence electrons. So its valency would be equal to the number of valence electrons.
I.e. Valency = Number of valence electrons
Valency = 2.
Hence, the valency of magnesium is equivalent to two.

Q11. What is the valency of sulphur?

Answer: If the valence electrons are less than or equal to 4, then the valency of an element is equal to the number of electrons in the outermost shell. In contrast, if the valence electrons are more than 4, the valency is determined by subtracting the valence electrons from 8.
The electronic configuration of sulphur is 2,8,6.
Thus, it has six valence electrons. So its valency would be equal to 8 - the number of valence electrons.
I.e. Valency = 8 - Number of valence electrons
Valency = 8 - 6
Valency = 2.
Hence, the valency of sulphur is equivalent to two.

Q12. What is the valency of phosphorous?
Answer: If the valence electrons are less than or equal to 4, then the valency of an element is equal to the number of electrons in the outermost shell. In contrast, if the valence electrons are more than 4, the valency is determined by subtracting the valence electrons from 8.
The electronic configuration of phosphorous is 2,8,5.
Thus, it has five valence electrons. So its valency would be equal to 8 - the number of valence electrons.
I.e. Valency = 8 - Number of valence electrons
Valency = 8 - 5
Valency = 3.
Hence, the valency of phosphorous is equivalent to three.

Q13. Match the following.

Column A	Column B
Iron	Monovalent
Valency	Proton
Neutral Particle	Neutron
Hydrogen	Combining capacity of an element
Positively charged particle	Fe

Answer:

Column A	Column B
Iron	Fe
Valency	Combining capacity of an element

Neutral Particle	Neutron
Hydrogen	Monovalent
Positively charged particle	Proton

Q14. Differentiate between valency and covalency.
Answer:

S. No.	Valency	Covlency
1.	Valency is the number of electrons an atom will lose or gain to stabilise itself.	Covalency is the maximum number of covalent bonds an atom forms using empty orbitals.
2.	Valency may or may not equal the number of valence electrons.	Covalency depends on the number of valence electrons of an element.
3.	It tells about the number of electrons required to fill the empty orbitals.	It depends on the number of empty orbitals present in the atom.
4.	It is for the elements forming an ionic or covalent bond.	It is for the elements forming a covalent bond.

Q15. Differentiate between valency and the valence electrons.
Answer:

S. No.	Valency	Valence Electron
1.	Valency is the combining capacity of an element.	Valence electrons are the electrons that take part in chemical bond formation.
2.	It explains the formation of bonds between atoms.	It explains the elemental character of an atom.

Practise Questions on Valency

Q1. Elements with valency 1 are
(a) Metals
(b) Non-metals
(c) Metalloids
(d) Either (a) or (b)
(e) Either (a) or (c)

Answer: (d), Elements with valency 1 are metals or non-metals.
Explanation: Elements with valency 1 are those elements which can either gain one electron or lose one electron to have a stable electronic configuration.
Example: Chlorine with the atomic number 17. It has an electronic configuration of 2,8,7.
Hence, it accepts one electron to form Cl^- and attains a stable octet configuration. Such elements are non-metals.
Whereas elements like sodium with atomic number 11 have an electronic configuration as 2,8,1.
It loses the outermost electron to become stable and form Na^+. Such elements are metals.
Hence, elements with valency 1 are metals or non-metals.

Q2. Give two examples of elements with valency 2.

Answer: Alkaline earth metals have valency 2. Examples include beryllium (Be), magnesium (Mg), calcium (Ca), strontium (Sr) and barium (Ba).

Q3. What is the valency of fluorine?

Answer: If the valence electrons are less than or equal to 4, then the valency of an element is equal to the number of electrons in the outermost shell. In contrast, if the valence electrons are more than 4, the valency is determined by subtracting the valence electrons from 8.
The electronic configuration of fluorine is 2,7.
Thus, it has seven valence electrons. So its valency would be equal to 8 - the number of valence electrons.
I.e. Valency = 8 - Number of valence electrons
Valency = 8 - 7
Valency = 1.
Hence, the valency of fluorine is equivalent to one.

Q4. What is the valency of X in XH_3?

Answer: In XH_3, one X atom has been combined with three hydrogen atoms.
3 x 1 = 3 valency units
Therefore, one atom of X will have three valency units.
So the valency of X in XH_3 is 3.

Q5. What is the valency of phosphorus in phosphorus pentoxide?

Answer: In Phosphorus pentoxide, two atoms of phosphorus have combined with five oxygen atoms.
5 x 2 = 10 valency units
Therefore, one atom of phosphorus will have 10 / 2 = 5 valency units
So the valency of phosphorus in phosphorus pentoxide is 5.