In ele	each of the ectron con	he given compound, indicate (in the blanks) the noble gas atoms that have the nfigurations as those of the elements in the compound.	e same
21	. K₂O	Electron configuration of K is similar to that of element	
		Electron configuration of O is similar to that of element	
22	. CaS	Electron configuration of Ca is similar to that of element	
		Electron configuration of S is similar to that of element	
23.	. AlI <sub>3</sub>	Electron configuration of Al is similar to that of element	
		Electron configuration of I is similar to that of element	
24.	Cs <sub>3</sub> N	Electron configuration of Cs is similar to that of element	
		Electron configuration of N is similar to that of element	
25.	BeH₂	Electron configuration of Be is similar to that of element	
	•	Electron configuration of H is similar to that of element	
26	SrBr <sub>2</sub>	Electron configuration of Sr is similar to that of element	
		Electron configuration of Br is similar to that of element	
27.	Ba₃P₂	Electron configuration of Ba is similar to that of element	
		Electron configuration of P is similar to that of element	
28.	Al <sub>2</sub> Se <sub>3</sub>	Electron configuration of Al is similar to that of element	
		Electron configuration of Se is similar to that of element	
29.	Rb₃P	Electron configuration of Rb is similar to that of element	
		Electron configuration of P is similar to that of element	•
30.	B <sub>2</sub> O <sub>3</sub>	Electron configuration of B is similar to that of element	
		Electron configuration of O is similar to that of element	

# Chemical bonding: Recalling concept facts and definitions

1.	Chemical bonding is th 1) Protons	e simultaneous attractio 2) Neutrons	n of two nuclei to 3) Electrons	4) Positron
2.	When atoms bond, the 1) Increase	ir stability 2) Decrease	3) Remain the same	
3.	When atoms bond, the nearest  1) Noble gas	electron configuration ( 2) Halogen	of each atom in the bond 3) Alkaline earth	resembles those of the 4) Alkali
4.	Atoms bond due to the 1) Protons and neutr 2) Protons and electrons		3) Neutrons and elect 4) Neutrons and positions  3) Neutrons and positions.	
5.	One main reason atom: 1) Get a stable electr 2) Get an unstable e		3) To gain protons 4) To lose x	

2) Get an unstable	electron configuration	4) To lose x	
bility of atoms in	a bond: Determining e	lements that bonded a	itoms resemble
When a hydrogen at atom will be similar t	om bonds with another at to that of the element	om, the electron configu	ration of the hydrogen
1) Lithium	2) Oxygen	3) Neon	4) Helium
similar to the configu	ration of which atom?		n of the oxygen ion will be
•	•	•	4) Sulfur
of calcium ion in the	compound will resemble th	nat of the element	, the electron configuration 4}) K
•	·	•	* *
1) LiH	2) LiF	3) NaH	4) NaCl
Argon?	vould the configuration of	-	und resembles that of
,	2) K₂O	· · ·	4) NaCl
those of Kr and Ne re	spectively?	i	_
1) Li and Cl	2) K and Cl	3) Al and Br	4) Sr and F
the same electron co	orine atoms combine to partine to partine atom of	roduce the compound Na	F, the ions formed have
1) Argon, only 2) Neon, only		<ul><li>3) Both argon and neo</li><li>4) Neither argon and r</li></ul>	
When the atoms of me configuration of the idea.	agnesium and chlorine bo	nd to form the compound esemble those of	d MgCl <sub>2</sub> , the electrons
<ol><li>Calcium and Bron</li></ol>	nine	3) Neon and Helium 4) Neon and Argon	
2 – 8 – 8. The electro	and to form a compound. To configuration of Y in the Configuration of	The electron configuration compound is 2 – 8. Which	n of X in the bond is n two atoms could be
1) X could be magne	sium and Y could be sulfur sium and Y could be oxyge	3) X could be calcium and A) X could be calcium a	and Y could be sulfur and Y could be oxygen
Which statement is tr	ue of the electron configur	ations of the ions in the	compound potassium
<ol> <li>Potassium ion wil</li> <li>Potassium ion wil</li> <li>Both potassium a</li> </ol>	resemble that of Argon, and bromine ions will resem	nd bromine ion will reser	mble that of Krypton argon
	When a hydrogen at atom will be similar to 1) Lithium  When an atom of ox similar to the configuration of calcium ion in the 1) O  When the atom of calcium ion in the 1) O  Which compound con 1) LiH  In which compound wargon?  1) Al <sub>2</sub> O <sub>3</sub> A bond between which those of Kr and Ne re 1) Li and Cl  When sodium and fluthe same electron con 1) Argon, only  When the atoms of maconfiguration of the ic 1) Calcium and Brom 2) Renyllium and Fluth atom X and atom Y bound 2 and Y?  1) X could be magne 2) X could be magne 2) X could be magne 3 Potassium ion will 3 Both potassium and Both	When a hydrogen atom bonds with another at atom will be similar to that of the element  1) Lithium  2) Oxygen  When an atom of oxygen bonds with a metal, to similar to the configuration of which atom?  1) Neon  2) Fluorine  When the atom of calcium bonds with oxygen to of calcium ion in the compound will resemble to the calcium ion in the compound will resemble to the calcium ion in the compound will resemble to the calcium ion in the compound will resemble to the calcium ion in the compound will resemble to the calcium ion in the compound will resemble to the calcium and Ne respectively?  1) Li H  2) K <sub>2</sub> O  A bond between which two atoms would product those of Kr and Ne respectively?  1) Li and Cl  2) K and Cl  When sodium and fluorine atoms combine to provide the same electron configuration as the atom of the same electron configuration as the atom of the ions in this compound will resemble the atoms of magnesium and chlorine bore configuration of the ions in this compound will resemble that of Krypton, and Y?  1) X could be magnesium and Y could be sulfur and Y could be magnesium and Y could be oxygen which statement is true of the electron configuration of Y in the calcium and Y could be magnesium and Y could be oxygen which statement is true of the electron configuration of Y in the calcium and Y could be magnesium and Y could be oxygen which statement is true of the electron configuration in will resemble that of Krypton, Potassium ion will resemble that of Argon, and Both potassium and Bromine ions will resemble that of Argon, and Both potassium and Bromine ions will resemble that of Argon, and Both potassium and Bromine ions will resemble that of Argon, and Both potassium and Bromine ions will resemble that of Argon, and Both potassium and Bromine ions will resemble that of Argon, and Both potassium and Bromine ions will resemble that of Argon, and Bromine ions will resemble that of Argon, and Bromine ions will resemble that of Argon, and and Bromine ions will resemble that of Argon, and the provided th	when a hydrogen atom bond: Determining elements that bonded at atom will be similar to that of the element  1) Lithium  2) Oxygen  3) Neon  When an atom of oxygen bonds with a metal, the electron configuration similar to the configuration of which atom?  1) Neon  2) Fluorine  3) Helium  When the atom of calcium bonds with oxygen to produce calcium oxide, of calcium ion in the compound will resemble that of the element  1) O  2) Ar  3) Kr  Which compound contains ions with electron configurations of both ion:  1) LiH  2) LiF  3) NaH  In which compound would the configuration of the atoms in the compound Argon?  1) Al <sub>2</sub> O <sub>3</sub> 2) K <sub>2</sub> O  3) CaCl <sub>2</sub> A bond between which two atoms would produce ions with electron conthose of Kr and Ne respectively?  1) Li and Cl  2) K and Cl  3) Al and Br  When sodium and fluorine atoms combine to produce the compound Nathes ame electron configuration as the atom of  1) Argon, only  3) Both argon and neo  4) Neither argon and neo  1) Argon, only  3) Neon and Helium  2) Neon, only  4) Neither argon and reconfiguration of the ions in this compound. The electron configuration of the ions in this compound. The electron configuration and Fluorine  2) Beryllium and Fluorine  3) Neon and Argon  Atom X and atom Y bond to form a compound. The electron configuration 2 - 8 - 8. The electron configuration of Y in the compound is 2 - 8. Which X and Y?  1) X could be magnesium and Y could be sulfur  3) X could be calcium and Which statement is true of the electron configurations of the ions in the bromide?  1) Potassium ion will resemble that of Krypton, and bromine ion will resemble those of the configuration of will resemble the configuration of will resemble that of Argon, and bromine ion will resemble thoround ill resemble the configuration of will resemble that of Argon, and bromine ion will resemble thoround ill resemble the configuration of will resemb

#### 5. Ionic bonding: Recalling concept facts and definition 1. Ionic bonding usually occurred between the atoms of 3) A metal and a nonmetal 1) A metal and another metal 4) Two of the same metalloid A nonmetal and another nonmetal 2. When combining with nonmetallic atoms, metallic atoms generally Lose electrons and form negative ions 3) Gain electrons and form negative ions 4) Gain electrons and form positive ions Lose electrons and form positive ions 3. When combining with a metallic atom, a nonmetallic atom tends to 3) Gain electrons and forms a negative ion 4) Gain electrons and forms a positive ion Lose electrons and forms a negative ion Lose electrons and forms a positive ion 4. When two atoms form an ionic bond, the electronegativity difference between these two atoms is generally 3) Exactly zero Greater than 1.7 Less than 1.7 4) Less than Zero In ionic bonding, electrons are 1) Always shared between a metal and a nonmetal atoms Always shared between two different nonmetals atoms Always transferred from a metal atom to a nonmetal atom Always transferred from a nonmetal atom to a metal atom Ionic bonding is formed when A Nonmetal loses electrons to a metal, which gains the electrons A Nonmetal loses electrons another nonmetal, which gains the electron A Metal atom loses electrons to a another metal, which gains the electrons A Metal atom loses electrons to a nonmetal, which gains the electrons 7. Which is true of a metallic atom in ionic bond with a nonmetal atom? The metal is usually a positive charged ion, because it had loss electrons The metal is usually a positive charged ion, because it had gained electrons The metal is usually a negative charged ion, because it had loss electrons The metal is usually a negative charged ion, because it had gained electrons 8. When a nonmetal atom forms ionic bond with a metal, the nonmetal becomes a 1) A positive ion, because it had gained electrons 2) A positive ion, because it had gained protons 3) A negative ion, because it had gained electrons. A negative ion, because it had gained protons. 6. Covalent Bonding: Recalling concept facts and definitions 1. A Covalent bond is formed between atoms of 1) Two nonmetals 3) A metal and a nonmetal 2) Two metals 4) A metal and a metalloid 2. Covalent bonding occurs when electrons are Transferred from a metallic atom to a nonmetallic atom 2) Transferred from a nonmetallic atom to a metallic atom 3) Shared between metallic atoms 4) Shared between nonmetallic atoms 3. When two atoms form a covalent bond, the electronegativity difference between these two atoms is generally 1) Greater than 1.7 3) Exactly zero 4) Less than Zero 2) Less than 1.7

3) Is either equal nor unequal

4) Can be equal or unequal

4. The sharing of electrons in covalent bonding

Polar, Nonpolar, and metallic
 Polar, nonpolar, and network solid
 Network solid, polar, and metallic
 Network solids, metallic, and nonpolar

5. Which list includes only types of covalent bonding?

Must always be equal
 Must always be unequal

#### 7. Polar and Nonpolar Covalent bonding: Recalling concept facts and definitions 1. The bonding in polar covalent bonding occurs when 3) Two different metals share electrons Two of the same metals share electrons 4) Two different nonmetals share electrons 2) Two of the same nonmetals share electrons 2. Sharing of electrons in polar covalent bonding is usually 1) Unequal between two different nonmetals 3) Equal between two different nonmetals 2) Unequal between two of the same nonmetals 4) Equal between two of the same nonmetals 3. The bonding in nonpolar covalent bonding occurs when 1) Two of the same metals share electrons 2) Two of the same nonmetals share electrons Two different metals share electrons 4) Two different nonmetals share electrons 4. Sharing in nonpolar covalent bonding is usually 1) Unequal between two different nonmetals 3) Equal between two of the same nonmetals 4) Equal between two different nonmetals 2) Unequal between two of the same nonmetals 5. When two atoms form a polar covalent bond, the electronegativity difference between these two atoms is generally 3) Less than 1.7 but greater than zero Exactly zero 4) Greater 1.7 Below Zero 6. When two atoms formed a nonpolar covalent bond, the electronegativity difference between these two atoms is usually 3) Exactly 1.7 1) About zero 4) Greater 1.7 Below Zero Metallic bonding is best described as 1) Positive ions in the sea of positive electrons 2) Positive ions in the sea of mobile electrons

## 9. Metallic bonding: Recalling concept facts and definitions

- 3) Negative ions in the sea of positive electrons
- 4) Negative ions in the sea of mobile electrons
- 2. Metallic bonding occurs between metal atoms that have
  - 1) Filled energy levels and low ionization energy
  - Filled energy levels and high ionization energy
  - Unfilled energy levels and low ionization energy
  - 4) Unfilled energy levels and high ionization energy
- 3. The ability to conduct electricity in the solid state is a characteristic of metallic substances. This characteristics is best explained by the presence of
  - 1) High ionization energy
  - 2) High electronegativity
  - 3) Mobile protons
  - 4) Mobile electrons

### 12

	1	•			•	
•	Cov	alent	bond: Determining form	ulas and names conta	ining covalent bondin	<b>g</b>
	1.		chemical formula contains a KCl	toms that are held toget 2) CaCl <sub>2</sub>	ther by covalent bonds? 3) AICl <sub>3</sub>	4) HCl
	2.		pair of atoms are held toget N-H	her by a covalent bond? 2) Li-H	3) Na-H	4) Ca – H
	3.		substance has atoms held to $H_2$	gether by a covalent bo	nd? 3) NaCl	4) NaH
	4.	Which 1) 2)	compound contains atoms h Sodium chloride Calcium hydride	eld together by covalen	t bonds? 3) Aluminum oxide 4) Nitrogen (II) oxide	
	5.	Which 1) 2)	element would most likely fo Iron Beryllium	orm a covalent bond wit	h a chlorine atom? 3) Phosphorous 4) Potassium	
	<b>6.</b>	A cova 1) 2)	lent bond will form between Group 16 and Group 18 Group 16 and Group 17	elements from which tv	vo groups of the Periodic 3) Group 1 and Group 2 4) Group 13 and Group	

1.	. Ionic Bonding: Determining formulas and names containing ionic bonding					
	1.	In wh	ich formula would the bondii HNO₃	ng between the atoms is 2) NH <sub>4</sub>	s described as ionic? 3) H <sub>2</sub> O	4) KCI
	2.		bond is ionic? N–O	2) Na – O	. 3) C – O	4) H – F
١.	3.	Which	pair of elements form a bon	d that is mostly ionic?		
			CaCl₂	2) CCI <sub>4</sub>	3) HCl	4) PCI <sub>s</sub>
	4.	Atoms	in which compound are held	together by ionic bond	ls?	
			CH₄	2) AlCl₃	3) H₂O	4) NH <sub>3</sub>
	5.	Which	element would most likely fo	orm an ionic bond with	chlorine?	
		1)	0	2) N	3) S	4) Sr
6	5.	Which	electron configuration belon	gs to an elements that v	would form ionic bond wi	ith aluminum?
		1)	2-3	2) 2 - 8 - 14 - 2	3) 2 - 8 - 6	4) 2
7	<b>7</b> .	1)	compound contains element Carbon dioxide Carbon monoxide	s that are held together	by ionic bonds?  3) Lithium bromide  4) Hydrogen bromide	
		-,	ou. son monoxide		4) Hydrogen bromide	
8			pair of atoms will form ionic l	bond?		•
			Hydrogen and sulfur		3) Magnesium and mag	
		2}	Hydrogen and oxygen		4) Magnesium and pho	sphorous
9		Elemen	ts in which two Groups of the	e Periodic Table would o	combine to form a bond t	hat is ionic?
		-	Group 1 and Group 2 Group 2 and Group 13		3) Group 2 and Group 1	
		2)	Gloup 2 and Gloup 13	·	4) Group 17 and Group	18
1	0.	Elemen elemen	t X combines with rubidium t t X be found?	o form an ionic bond. Ir	n which Group of the Peri	odic Table could
			Group 1		3) Group 2	
			Group 13	* ,	4) Group 16	

1.	In which substance woul  1) Calcium	d the atoms be held togethe		
	1) Calcium	2) Carbon	3) Oxygen	4) Helium
2.	The atoms of which subs	tance are held together by a	metallic bond?	
	1) H <sub>2</sub> (g)	2) H <sub>2</sub> O (I)	3) SiC(s)	4) Fe(s)
3.	Which substance contain	s metallic bonding?		
	1) Sodium Chloride	. •	3) Hydrogen chloride	2
	2) Carbon		4) Copper	
4.	Which electron configura	tion belongs to a substance	whose atoms are held toget	her hy metallic
	1)2-8-8	2) 1	3) 2 – 8 – 18 – 18	

16. Types of bonds: Determining formula based on bond description

1. Which substance contains bonds resulting from a transfer of electrons from one atom to another? 2) NH<sub>3</sub> 3) KBr 4) Cl<sub>2</sub> 1) CO<sub>2</sub> 2. Which pair of atoms will share electrons when a bond is formed between them? 2) Br and F 3) K and Cl 4) Li and I 3. In which compound do the atoms form bonds by sharing electrons? 2) Na<sub>2</sub>O 4) MgO 4. In which substance is the bonding between the atoms a result of equal sharing of electrons? 2) Na 3) CO<sub>2</sub> 5. In which substance is the bonding between the atoms a result of positive ions in the sea of mobile electrons? 1) C  $2) N_2$ 3) He 6. The bonding in which compound a result of unequal sharing of electrons between the atoms? 2) H<sub>2</sub> 3) Cl<sub>2</sub> 7. Which pair of atoms will form a bond when electrons are transferred from one atom to the other? 2) Ca and O 3) N and O 4) O and O 1) Cand O 8. Which pair of electrons configurations belong to atoms that will share electrons when they bond with each other? 3) 2-8-6 and 2-8-18-71) 2-8-2 and 2-8-12) 2-8-18-8 and 2-8-13-1 4) 2-8-5 and 2-8-18-8-1

Set A: Terms and de	efinitions	Objective: By dej with	fining these wor In types of bondir	ds, you should na related ten	l become more ns and their dei	familiar initions
Define, neatly and	l clearly, the fo	llowing bonding	related terms.	A TERUCE TEN	no una tricii aci	micions.
1. Intramolecular i	orces					
2. Ionic bond						
3. Covalent bond					٠	
4. Polar covalent b	ond					
5. Nonpolar covale	nt bond					
6. Network solid co	valent bond					
7. Coordinate cova	lent bond					
8. Metallic bond						
Set B: Type of bondi	ng	<b>Objective:</b> To	test your knowle	edge of facts i	related to bond	types.
Indicate which bon Ionic, covalent, pole				_	• -	
9. A bond in which	two atoms shar	re electrons unec	qually.			1988 - 1 L
10. A bond in which	the two atoms	s have electrone	gativity differend	ce of zero.	<del>*************************************</del>	<del></del>
11. Bonding in whic	h positive nucle	ei are immersed	in sea of mobile	electrons.		
12. A bond in which	two atoms sha	are electrons equ	rally.		1	
13. A bond betwee						
14. A bond in which	one atom tran	sfers electron to	another atom.			<del></del> [

15. One atom in this bond provides	s both shared electrons.
16. A bond in which electronegativi	ty difference between two atoms is 2.0
17. A bond holding atoms in diatom	nic molecules together.
18. Bonding between different nonr	metal atoms.
19. Bonding between atoms in a mo	plecule.
20. Electronegativity difference betw	ween two atoms this bond type will be 0.8
21. Bonding resulting from one aton	n losing and another gaining electrons.
22. Bonding resulting from electrosi	tatic attractions between opposite charges.
23. Bonding found in polyatomic ior	ns.
24. Atoms in a diamond are held tog	rother by this has d?
C: Type of bonding	Objection To test your of life to date
-	between atoms in a given formula
	between atoms in a given formula
Indicate which bond type is found b Use the list of bond types below.	between atoms in a given formula
Indicate which bond type is found b Use the list of bond types below.	between atoms in a given formula  petween the atoms given or between atoms in the formula give
Indicate which bond type is found b Use the list of bond types below. Ionic, polar covalent, nonpolar covale 25. Lithium and Oxygen	between atoms in a given formula  petween the atoms given or between atoms in the formula give  lent, coordinate covalent, network solid covalent, metallic  33. HCI
Indicate which bond type is found b Use the list of bond types below. Ionic, polar covalent, nonpolar coval 25. Lithium and Oxygen 26. Aluminum and chlorine	between atoms in a given formula  petween the atoms given or between atoms in the formula give  lent, coordinate covalent, network solid covalent, metallic  33. HCI
Indicate which bond type is found b Use the list of bond types below. Ionic, polar covalent, nonpolar covale 25. Lithium and Oxygen	between atoms in a given formula  petween the atoms given or between atoms in the formula give  lent, coordinate covalent, network solid covalent, metallic  33. HCl  34. Na <sub>2</sub> SO <sub>4</sub>
Indicate which bond type is found b Use the list of bond types below. Ionic, polar covalent, nonpolar coval 25. Lithium and Oxygen 26. Aluminum and chlorine 27. Nitrogen and Nitrogen	between atoms in a given formula  netween the atoms given or between atoms in the formula give  lent, coordinate covalent, network solid covalent, metallic  33. HCl  34. Na <sub>2</sub> SO <sub>4</sub> 35. Cl <sub>2</sub>
Indicate which bond type is found b Use the list of bond types below. Ionic, polar covalent, nonpolar covale 25. Lithium and Oxygen 26. Aluminum and chlorine 27. Nitrogen and Nitrogen 28. Carbon and bromine	lent, coordinate covalent, network solid covalent, metallic  33. HCl  34. Na <sub>2</sub> SO <sub>4</sub> 35. Cl <sub>2</sub> 36. Ag
Indicate which bond type is found b Use the list of bond types below. Ionic, polar covalent, nonpolar covale 25. Lithium and Oxygen 26. Aluminum and chlorine 27. Nitrogen and Nitrogen 28. Carbon and bromine 29. Phosphorous and oxygen	between atoms in a given formula  netween the atoms given or between atoms in the formula give  lent, coordinate covalent, network solid covalent, metallic  33. HCl  34. Na <sub>2</sub> SO <sub>4</sub> 35. Cl <sub>2</sub> 36. Ag  37. CCl <sub>4</sub>
Indicate which bond type is found be Use the list of bond types below. Ionic, polar covalent, nonpolar covalent, nonpolar covalent.  25. Lithium and Oxygen  26. Aluminum and chlorine  27. Nitrogen and Nitrogen  28. Carbon and bromine  29. Phosphorous and oxygen  30. Calcium and fluorine  31. Hydrogen and Hydrogen	between atoms in a given formula  netween the atoms given or between atoms in the formula give  lent, coordinate covalent, network solid covalent, metallic  33. HCl  34. Na <sub>2</sub> SO <sub>4</sub> 35. Cl <sub>2</sub> 36. Ag  37. CCl <sub>4</sub> 38. SiC
Indicate which bond type is found by Use the list of bond types below. Ionic, polar covalent, nonpolar covalent, nonpolar covalent.  25. Lithium and Oxygen  26. Aluminum and chlorine  27. Nitrogen and Nitrogen  28. Carbon and bromine  29. Phosphorous and oxygen  30. Calcium and fluorine	between atoms in a given formula  petween the atoms given or between atoms in the formula give  lent, coordinate covalent, network solid covalent, metallic  33. HCl  34. Na <sub>2</sub> SO <sub>4</sub> 35. Cl <sub>2</sub> 36. Ag  37. CCl <sub>4</sub> 38. SiC  39. MgF <sub>2</sub>

		bonding in networ Ionic	2) Covale	ent 3) M	etallic	4) Hydrogen
2	Subs	tances containing	network solid bondi	ng contain		
۷.		Particles that are			rticles that a	are metallic
		Particles that are			o discrete pa	
3.	Netv	vork solid honding	forms substances th	at have		
٠,٠		Low melting poir			gh electrical	conductivity
		High melting poi			gh solubility	
4	Δ co.	ordinate covalent l	bonding is formed wi	han		
			s one of its electron			
	2)	An atom shares of	one of its electron wi	th a hydrogen ion		
	3)	An atom transfer	s two of its electrons	to a hydrogen ion		
	4)	An atom shares t	wo of its electron w	ith a hydrogen ion		
5.			oond can be form be			
			nd a hydrogen atom			
			nd a nitrogen atom o			
			a hydrogen atom of a nitrogen atom of a			
	7,	A Sociality of and	a muogen atom or a	arranoma anolecule		
6.			onding will form by		n	
			ind an oxygen atom ond a hydrogen atom			
			d an oxygen atom of			
			d a hydrogen atom of			
7.	Which	h two substances o NH₃ and NH₄⁺	can form a coordinat			
		INITS CHIEF INITA		3) 191	₃ and H₂O	
				4) VII-	L <sup>†</sup> and H.O <sup>†</sup>	F
		H <sub>2</sub> O and H <sub>3</sub> O <sup>↑</sup>		4) NH	<sub>4</sub> <sup>+</sup> and H <sub>3</sub> O <sup>4</sup>	
	2) es of	H <sub>2</sub> O and H <sub>3</sub> O *  bonding: Dete	rmining bond type med when electrons 2) lonic	4) NH from bond descri are shared between	<b>ptions</b> n two atoms	?
	2) es of	H <sub>2</sub> O and H <sub>3</sub> O <sup>↑</sup> bonding: Dete		4) NH	<b>ptions</b> n two atoms	
1. \	es of Which 1) Co	H <sub>2</sub> O and H <sub>3</sub> O * <b>bonding:</b> Deter  type of bond is for ovalent  kind of bond is for	med when electrons  2) lonic  med between a proto	from bond descri are shared between 3) Metallic on ( H <sup>+</sup> ) and a water	<b>ptions</b> n two atoms 4	?
1. \	es of Which 1) Co	H <sub>2</sub> O and H <sub>3</sub> O * <b>bonding:</b> Dete	med when electrons 2) Ionic	from bond descri are shared between 3) Metallic on ( H <sup>+</sup> ) and a water	ptions  1 two atoms 4  1 molecule?	?
1. \	es of Which 1) Co	h <sub>2</sub> O and H <sub>3</sub> O *  bonding: Dete  type of bond is for  ovalent  kind of bond is for  onpolar covalent	med when electrons 2) lonic med between a proto 2) Coordinate cov	from bond descri are shared between 3) Metallic on ( H <sup>+</sup> ) and a water alent 3) Polar	ptions n two atoms 4 r molecule? 4	? } Hydrogen ) Network solid
1. \ 2. \ 3. \	es of Which 1) Co Which I 1) No	bonding: Detectype of bond is for ovalent covalent type of bond is for onpolar covalent type of bonding in	med when electrons  2) lonic  med between a proto  2) Coordinate cov  volves positive ions i	from bond descri are shared between 3) Metallic on ( H <sup>+</sup> ) and a water alent 3) Polar	ptions  1 two atoms 4  1 molecule? 4  1 mobile elec	? } Hydrogen ) Network solid trons?
1. \ 2. \ 3. \	es of Which 1) Co Which I 1) No	h <sub>2</sub> O and H <sub>3</sub> O *  bonding: Dete  type of bond is for  ovalent  kind of bond is for  onpolar covalent	med when electrons 2) lonic med between a proto 2) Coordinate cov	from bond descri are shared between 3) Metallic on ( H <sup>+</sup> ) and a water alent 3) Polar	ptions  1 two atoms 4  1 molecule? 4  1 mobile elec	? } Hydrogen ) Network solid
1. \ 2. \ 3. \	es of Which I 1) Co Which I 1) No	bonding: Deter type of bond is for ovalent kind of bond is for onpolar covalent type of bonding in ar covalent	med when electrons 2) lonic med between a proto 2) Coordinate cov volves positive ions ii 2) Nonpolar coval	from bond descri are shared between 3) Metallic on ( H <sup>+</sup> ) and a water alent 3) Polar mmersed in a sea of ent 3) Ionic	ptions 1 two atoms 4 1 molecule? 4 1 mobile elec	? } Hydrogen ) Network solid trons? ) Metallic
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. Network solids and coordinate covalent bonding: Recalling concept facts and definitions

- 8. Which type of bond exists in a molecule in which electrons are shared unequally between the two atoms of the molecule?
  - 1) A polar covalent bond with an electronegativity difference of zero
  - 2) A polar covalent bond with an electronegativity difference greater than zero
  - 3) A nonpolar covalent bond with an electronegativity difference of zero
  - 4) A nonpolar covalent bond with an electronegativity difference greater than zero
- 9. When one atom loses one or more electrons to another, the bond formed between the two atoms is best described as
  - 1) Ionic with electronegativity difference of greater than 1.7
  - 2) Ionic with electronegativity difference of less than 1.7
  - 3) Covalent with electronegativity difference of greater than 1.7
  - 4) Covalent with electronegativity difference of less than 1.7
- 10. Atom X bonds with another atom X to form  $X_2$  molecule. The bond in this molecule is
  - 1) Polar because electrons are shared equally
  - 2) Nonpolar because electrons are shared equally
  - 3) Polar because electrons are shared unequally
  - 4) Nonpolar because electrons are shared unequally

13. Polar/nonpolar/coordinate/network solid: Determining formulas and names

4				
1.	Which formula contains nonpolar 1) NH <sub>3</sub>	covalent bonds? 2) H <sub>2</sub> O	3) O <sub>2</sub>	4) NaCl
	. •	·	-, -,	.,
2.	In which formula are the atoms he	ald together by nonpola	- countant hands	•
	1) F <sub>2</sub>	2) OF <sub>2</sub>	r covalent bonds?	4) LiF
	-, - <u>2</u>	2, 4. 2	aj in	4 <i>]</i> LIF
3.	Which pair of atoms are held toget	that he a nannalar count	to an to a with	
٠.	1) Co – Cl	erner by a nonpolar covale 2) K – O	ent bond? 3) N – H	AL IA IA
	1, 60 6.	2, K = U	5) N – n	4) N – N
4.	The bonding in which formula is p			
٠,	1) H <sub>2</sub> O	oolar covalent? 2) H <sub>2</sub>	2) ()	43 N = 0
	1, 1120	ZJ Fiz	3) O <sub>2</sub>	4) Na₂O
5	Which compared contains atoms	f - F f + «h h	• =	
ο.	Which compound contains atoms I  1) CaCl <sub>2</sub>	held together by polar bo 2) CO <sub>2</sub>		****
	1) Cacı <sub>2</sub>	2) (02	3) O <sub>2</sub>	4) Li <sub>2</sub> O
c	Milital Accordance and hold to make	· · · · · · · · · · · · · · · · · · ·		
о.	Which two atoms are held togethe  1) Br-Cl			- to a succession
	1) DI-CI	2) Al-Cl	3) Cl-Cl	4) Sr-Cl
٠,				
7.				÷ -
	1) O <sub>2</sub>	2) SiO <sub>2</sub>	3) NaCl	4) HCI
_				
8.	Which substance contains network			
	1) H <sub>2</sub> O	2) SO <sub>2</sub>	3) C	4) Br <sub>2</sub>
9.	Coordinate covalent bonding would			
	1) Hydronium ion	2) Hydrogen ion	3) Oxygen	4) Sodium chloride
				j
10.	Which formula contains atoms held	d together by a coordinat	te covalent bond?	1
	1) SiC	2) CaCl <sub>2</sub>	3) NH <sub>3</sub>	4) NH <sub>4</sub> <sup>+</sup>
			· •	•

1.	Which formula contains both ionic			
	1) MgS	2) NaBr	3) $C_6H_{12}O_6$	4) MgSO₄
2.	Which compound contains atoms	that are held tos	ether by ionic and covalent bo	onds?
	1) H₂O	2) SiC	3) NaNO <sub>3</sub>	4) CH₄
	2,25	2,0.0	<i>5),</i> ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	.,4
3.	Which formula contains both ionic	and covalent bo	onds?	
	1) Ca(OH)₂	2) HCI	3) CH₃OH	4) P <sub>2</sub> O <sub>4</sub>
4.	Which compound contains both io	nic and covalent	bonds?	
	1) Ammonia		3) Methane	
	2) Lithium sulfate		4) Potassium chlorid	e
5.	Which compound has atoms that a	re held togethe	r by both ionic and covalent b	onds?
	1) Ammonium chloride	•	3) Sodium Chloride	
	2) Hydrogen chloride		4) Copper(II) Chlorid	e
			•	
	pes of bond: Determining bon			·····
1.	The bonding in calcium phosphate  1) Covalent, only	, ca <sub>3</sub> (PO <sub>4</sub> ) <sub>2</sub> , ca		
	2) Both covalent and ionic		3) Ionic, only	
	Z) BOUT COVAIENT AND JOINE	•	4) Neither covalent nor ionic	·
2.	Which best describes the bonding	in Cl <sub>2</sub> ?		
	Polar and covalent		3) Network sold and covalen	t
	2) Nonpolar and covalent		4) Coordinate and covalent	
3.	Which type of bond is found between	en the Cland H	atoms in a molecule of mothe	ane CH.2
-	1) Covalent bonds	ciic e unu II	3) Hydrogen bonds	ane, Cita F
	2) Ionic bonds		4) Metallic bonds	
	-,		Ty Wictains Dollas	
1.	The bonding in a hydronium ion, H	O <sup>†</sup> is best descr	ibed as	
	1) Polar and covalent		3) Network sold and covalent	t
	2) Nonpolar and covalent		4) Coordinate and covalent	
<b>5</b> .	The C – Cl bond in CCl <sub>4</sub> is best desc	ribed as		
	1) Ionic, because electrons are tra		3) Covalent , because electro	ns are transferre
	2) Ionic, because electrons are sha		4) Covalent, because electro	
5.	Bonding between the two bromine	atoms in a brom	ine molecule is best describer	l as
	1) Ionic	2	3) polar covalent	: -: <del>-</del>
	2) nonpolar covalent		4) Network Covalent	
,	The transfer of electrons from a soc	lium atom to a c	bloring atom recults in the for	mation of
•	Coordinate covalent bond	num atom to a C	nionne atom results in the for 3) Nonpolar covalent bond	mativii or
	Polar covalent bond		4) Ionic bond	
			Joine bond	
. ·	The carbon atoms in diamond are h	eld together by		
	1) Metallic bonds	•	3) Hydrogen bonds	

4) Covalent bonds

2) Ionic bonds

9.	A bond that holds atoms of nickel together is	
	Metallic bond	3) Ionic bonds
	2) Network covalent bond	4) Coordinate covalent bond
10.	. As a bond between a hydrogen atom and a sulfur a	tom is formed, electrons are
	1) Shared to form an ionic bond	3) Lost and gained to form an ionic bond
	2) Shared to form a covalent bond	4) Lost and gained to form a covalent bond
11.	. As a bond is formed between atoms of lithium and	
	Shared to form an ionic bond	3) Lost and gained to form an ionic bond
	2) Shared to form a covalent bond	4) Lost and gained to form a covalent bond
12	Bonding in ammonia is best described as	
1	1) Covalent	3) Ionic
	2) Coordinate	4) Metallic
	<b>-,</b>	- Trecome
13.	Magnesium nitrate contains chemical bonds that ar	e
1	1) Covalent only	3) Ionic Only
1	2) Both covalent and ionic	4) Neither covalent nor ionic
	•	,
14.	Bonding between the atoms in a water molecule is	
ł	1) Nonpolar covalent	3) coordinate covalent
	2) Polar covalent	4) Network solid
15.	When a reaction occurs between atoms with groun	d state electron configurations of 2-1 and 2-7.
	the bond formed is mainly	, , , , , , , , , , , , , , , , , , ,
	1) Polar covalent	3) Nonpolar covalent
	2) Metallic	4) Ionic
16.	Element magnesium bonds with oxygen to form mag	gnesium oxide. MgO. This bond is mostly
	<ol> <li>Ionic, because electrons are shared between Mg</li> </ol>	gand O
	<ol><li>lonic, because electrons are transferred from M</li></ol>	g to O
	<ol><li>Covalent, because electrons are shared between</li></ol>	Mg and O
	<ol><li>Covalent, because electrons are transferred from</li></ol>	n Mg to O
17.	Which type of bond exists in a molecule of hydrogen	indide?
	A polar covalent bond, with an electronegativity	difference of zero
	<ol><li>A polar covalent bond, with an electronegativity</li></ol>	difference greater than zero
	3) A nonpolar covalent bond, with an electronegati	vity difference of zero
	4) A nonpolar covalent bond, with an electronegati	vity difference greater than zero
18.	Two atoms with ground state electron configuration: form a bond that is	s of 2 – 8 – 1 and 2-8 – 6 would most likely
	<ol> <li>Covalent, because there will be a sharing of elect</li> <li>Covalent, because there will be a transferring of</li> </ol>	rons
	3) Ionic, because there will be a sharing of electrons	electrons
	4) Ionic, because there will be a transferring of electrons	
	of city	uons
19. /	An atom with electronegativity of 0.9 bonds with an a	atom with electronegativity of 3.1. Which
ţ	phrase best describes the bond between the elemen	ts of these atoms?
	l) Mostly covalent in character, and is formed betw	een two nonmetals
	2) Mostly covalent in character, and is formed betw	een a metal and a nonmetal
	Mostly ionic in character, and is formed between	a metal and a nonmetal
4	<ol> <li>Mostly ionic in character, and is formed between</li> </ol>	two nonmetals
20. A	An element with electronegativity value of 3.5 bonds 3.0.	with an element with electronegativity value of

Which best describes the bond between these two elements?

1) Mostly covalent in character, and is formed between two nonmetals

4) Mostly ionic in character, and is formed between two nonmetals

2) Mostly covalent in character, and is formed between a metal and a nonmetal3) Mostly ionic in character ,and is formed between a metal and a nonmetal