8	1	Multin	le-Choice	and Rime	ndal (Duestions
o.	1.	MINIM	ic-Ciioice	anu Diin	vuai v	/ucsuviis

8.1 Multiple-Choice and Bimodal Questions	E) I ⁻
1) There are paired and unpaired electrons in the Lewis symbol for a phosphorus atom.	6) There are unpaired electrons in the Lewis symbol for an oxygen atom.
	A) 0
A) 4, 2 B) 2, 4	B) 1
B) 2, 4	C) 2
C) 2, 3 D) 4, 3	D) 4
E) 0, 3	E) 3
L) 0, 3	7) Have many compained also thomas and thomain the
2) In the Lewis symbol for a fluorine atom, there	7) How many unpaired electrons are there in the $\frac{1}{2}$
are paired and unpaired	Lewis structures of a N^{3-} ion?
electrons.	A) 0
	B) 1
A) 4, 2	C) 2
B) 4,1	D) 3
C) 2, 5	E) This cannot be predicted.
D) 6, 1	,
E) 0, 5	8) How many unpaired electrons are there in an
2) Deced on the estat rule magnesium most likely	O^{2-} ion?
3) Based on the octet rule, magnesium most likely	
forms a ion.	A) 0
A) Mg ²⁺	B) 1
	C) 2
B) Mg ²⁻	D) 3
C) Mg ⁶⁻	E) This cannot be predicted.
D) Mg ⁶⁺	9) The electron configuration of the phosphide ion
E) Mg ⁻	(P^{3-}) is
	(1) 15
4) Based on the octet rule, phosphorus most likely	A) [Ne]3S ²
forms a ion.	B) [Ne]3S ² 3P ¹
A) P^{3+}	C) [Ne]3S ² 3P ³
B) P ³⁻	D) [Ne]3P ²
C) P ⁵⁺	E) $[Ne]3S^23P^6$
D) P ⁵⁻	10) The halogens, alkali metals, and alkaline earth
E) P ⁺	metals have valence electrons,
2) 1	respectively.
5) Based on the octet rule, iodine most likely forms	To pour voy.
anion.	A) 7, 4, and 6
	B) 1, 5, and 7
A) I^{2+}	C) 8, 2, and 3
B) I ⁴⁺	D) 7, 1, and 2
C) I ⁴⁻	E) 2, 7, and 4

D) I⁺

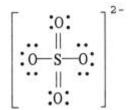
Chemistry, 11e (Brown/Lemay/Bursten/Murphy) Chapter 8: Basic Concepts of Chemical Bonding	
	D) $[Ne]3S^23p^6$
11) The only noble gas without eight valence	E) $[Kr]3S^22p^{-6}$
electrons is	, , , ,
A) Ar	16) The principal quantum number of the electrons
B) Ne	that are lost when tungsten forms a cation is
C) He	·
D) Kr	
E) All noble gases have eight valence electrons.	A) 6
	B) 5
12) Which of the following would have to lose two	C) 4 D) 3
electrons in order to achieve a noble gas electron	E) 2
configuration?	L) 2
O Sr Na Se Br	17) Which one of the following species has the
A) O So	electron configuration[Ar]3d ⁴ ?
A) O, Se B) Sr	orotaon comiguration [i k] Su i
C) Na	A) Mn^{2+}
D) Br	B) Cr ²⁺
E) Sr, O, Se	C) V ³⁺
	D) Fe ³⁺
13) Which of the following would have to gain two	·
electrons in order to achieve a noble gas electron	E) K ⁺
configuration?	18) What is the electron configuration for the Co ²⁺
O Sr Na Se Br	ion?
A) Br	1011:
B) Sr	A) $[Ar]4S^{1}3d^{6}$
C) Na	B) [Ar]4S ⁰ 3d ⁷
D) O, Se	
E) Sr, O, Se	C) $[Ar]4S^03d^5$
	D) $[Ar]4S^23d^9$
14) For a given arrangement of ions, the lattice	E) $[Ne]3S^23p^{10}$
energy increases as ionic radius and	
as ionic charge	19) What is the electron configuration for the Fe ²⁺
A) decreases, increases	ion?
B) increases, decreases	
C) increases, increases	A) $[Ar]4S^03d^6$
D) decreases, decreases	B) $[Ar]4S^23d^4$
E) This cannot be predicted.	C) $[Ar]4S^03d^8$
	D) [Ar]4S ² 3d ⁸
15) The electron configuration of the S^{2-} ion is	
·	$E) [Ar]4S^63d^2$
	20) The formula of polledium (IV) sulfide is
A) $[Ar]3S^23p^6$	20) The formula of palladium(IV) sulfide is
B) $[Ar]3S^23p^2$	·
C) $[Ne]3S^23p^2$	A) Pd_2S_4
	· 4 +

Chemistry, 11e (Brown/Lemay/Bursten/Murphy)	
Chapter 8: Basic Concepts of Chemical Bonding	D) 2
B) PdS ₄	B) 2
C) Pd ₄ S	C) 3 D) 4
D) PdS ₂	E) 5
E) Pd_2S_2	<i>=,</i> c
, 2 2	26) A double bond consists of pairs of
21) Elements from opposite sides of the periodic table tend to form	electrons shared between two atoms.
table tend to form	A) 1
A) covalent compounds	B) 2
B) ionic compounds	C) 3
C) compounds that are gaseous at room	D) 4
temperature	E) 6
D) homonuclear diatomic compounds	
E) covalent compounds that are gaseous at room	27) What is the maximum number of double bonds
temperature	that a hydrogen atom can form?
22) Determining lattice energy from Born-Haber	A) 0
cycle data requires the use of	B) 1
cycle data requires the use of	Ć) 2
A) the octet rule	D) 3
B) Coulomb's law	E) 4
C) Periodic law	,
D) Hess's law	28) What is the maximum number of double bonds
E) Avogadro's number	that a carbon atom can form?
	A. A
23) How many single covalent bonds must a	A) 4
silicon atom form to have a complete octet in its	B) 1
valence shell?	C) 0
	D) 2
A) 3	E) 3
B) 4	20) In the medical halom which are the
C) 1	29) In the molecule below, which atom has the
D) 2	largest partial negative charge?
E) 0	Cl L
	F-C-Br
24) A covalent bond between the	
same two atoms is the longest.	I
A) single	A) C1
B) double	A) Cl B) F
C) triple	,
D) They are all the same length.	C) Br D) I
E) strong	E) C
· ·	<i>L</i> , <i>C</i>
25) How many hydrogen atoms must bond to	30) The ability of an atom in a molecule to attract
silicon to give it an octet of valence electrons?	electrons is best quantified by the
A > 1	
A) 1	A) paramagnetism

Chemistry, 11e (Brown/Lemay/Bursten/Murphy)	
Chapter 8: Basic Concepts of Chemical Bonding	D) 14
B) diamagnetism	B) 14
C) electron change to mass ratio	C) 16
D) electron change-to-mass ratio	D) 10 E) 12
E) first ionization potential	E) 12
31) Given the electronegativities below, which	36) The Lewis structure of AsH ₃ shows
covalent single bond is most polar?	nonbonding electron pair(s) on As.
Element: H C N O	nonconding election pan(s) on 71s.
Electronegativity: 2.1 2.5 3.0 3.5	A) 0
•	B) 1
A) C-H	C) 2
B) N-H	D) 3
C) O-H	•
D) O-C	E) This cannot be determined from the data given
E) O-N	37) The Lewis structure of PF shows that the
	37) The Lewis structure of PF_3 shows that the
32) Electronegativity from left to	central phosphorus atom has
right within a period and from top to	nonbonding and bonding electron
bottom within a group.	pairs.
	A) 2, 2
A) decreases, increases	B) 1, 3
B) increases, increases	C) 3, 1
C) increases, decreases	
D) stays the same, increases	D) 1, 2
E) increases, stays the same	E) 3, 3
33) A nonpolar bond will form between two	38) The Lewis structure of HCN (H bonded to C)
, <u>*</u>	shows that has
atoms of	nonbonding electron pairs.
electronegativity.	
A) different, opposite	A) C, 1
B) identical, different	B) N, 1
C) different, different	C) H, 1
D) similar, different	D) N, 2
E) identical, equal	E) C, 2
L) Identical, equal	
24) The ion ICI - has valence	39) The formal charge on carbon in the molecule
34) The ion ICI ₄ has valence	below is
electrons.	
A) 24	0=C=0
A) 34	. · .
B) 35	
C) 36	A) 0
D) 28	B) +1
E) 8	C) +2
	D) +3
35) The ion NO ⁻ has valence	E) -1
electrons.	
	40) The formal charge on nitrogen in NO ₃ ⁻ is
A) 15	,

- A) -1
- B) 0
- C) + 1
- D) +2
- E) -2

41) The formal charge on sulfur in SO_4^{2-} is ______, where the Lewis structure of the ion is:



- A) -2
- B) 0
- C) +2
- D) +4
- E) -4

42) In the Lewis structure of ClF, the formal charge on Cl is _____ and the formal charge on F is _____.

- A) -1, -1
- B) 0, 0
- C) 0, -1
- D) +1, -1
- E) -1, +1

43) In the resonance form of ozone shown below, the formal charge on the central oxygen atom is

A)0

- B) +1
- C) -1
- D) +2
- E) -2

44) How many equivalent resonance forms can be drawn for CO_3^{2-} - (carbon is the central atom)?

- A) 1
- B) 2
- C) 3
- D) 4
- E) 0

45) How many equivalent resonance forms can be drawn for SO₂ without expanding octet on the sulfur atom (sulfur is the central atom)?

- A) 0
- B) 2
- C) 3
- D) 4
- E) 1

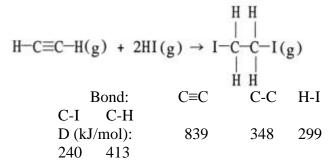
46) How many equivalent resonance structures can be drawn for the molecule of SO₃ without having to violate the octet rule on the sulfur atom?

- A) 5
- B) 2
- **C**) 1
- D) 4
- E) 3

47) How many different types of resonance structures can be drawn for the ion SO_3^{2-} where all atoms satisfy the octet rule?

- A) 1
- B) 2
- C) 3
- D) 4
- E) 5

48) Using the table of average bond energies below, the ΔH for the reaction is _____ kJ.



- A) +160
- B) -160
- C) -217
- D) -63
- E) +63
- 49) Using the table of average bond energies below, the ΔH for the reaction is _____ kJ.

$$H-C \equiv C-H(g) + H-I(g) \rightarrow H_2C = CHI(g)$$

Bond: C≡C C=C H-I C-I C-H D (kJ/mol): 839 614 299 240 413

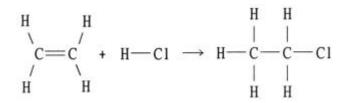
- A) +506
- B) -931
- C) -506
- D) -129
- E) +129
- 50) Using the table of average bond energies below, the ΔH for the reaction is _____ kJ.

$$C \equiv O(g) + 2H_2(g) \rightarrow H_3C - O - H(g)$$

Bond: C-O C=O C≡O C-H H-H O-H D (kJ/mol): 358 799 1072 413 436 463

- A) +276
- B) -276
- C) +735
- D) -735
- E) 116
- 51) Using the table of bond dissociation energies,

the ΔH for the following gas-phase reaction is kJ.



Bond	D (kJ/mol)
C-C	348
C=C	614
C-H	413
H-Cl	431
C-Cl	328

- A) -44
- B) 38
- C) 304
- D) 2134
- E) -38
- 52) Using the table of bond dissociation energies, the ΔH for the following gas-phase reaction is _____ kJ.

Bond	D (kJ/mol)
C-C	348
C=C	614
C-H	413
H-Br	366
C-Br	276

- A) 291
- B) 2017
- C) -57
- D) -356
- E) -291
- 53) Using the table of bond dissociation energies, the ΔH for the following reaction is _____kJ.

$$2HCl(g) + F_2(g) \rightarrow 2HF(g) + Cl_2(g)$$

Bond	D (kJ/mol)
H-Cl	431
F-F	155
H-F	567
Cl-Cl	242

- A) -359
- B) -223
- C) 359
- D) 223
- E) 208

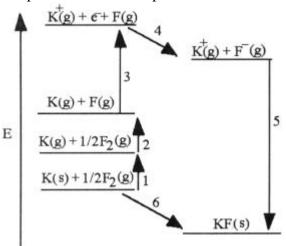
8.2 Multiple-Choice Questions

- 1) Which ion below has a noble gas electron configuration?
- A) Li²⁺
- B) Be²⁺
- C) B²⁺
- D) C²⁺
- E) N²⁻
- 2) Of the ions below, only _____ has a noble gas electron configuration.
- A) S^{3+}
- B) O²⁺
- C) I⁺
- D) K⁻
- E) Cl⁻
- 3) Which of the following has eight valence electrons?
- A) Ti⁴⁺
- B) Kr
- C) Cl⁻
- D) Na+
- E) all of the above
- 4) Which of the following does <u>not</u> have eight valence electrons?
- A) Ca⁺
- B) Rb⁺
- C) Xe

- D) Br
- E) All of the above have eight valence electrons.
- 5) The chloride of which of the following metals should have the greatest lattice energy?
- A) potassium
- B) rubidium
- C) sodium
- D) lithium
- E) cesium
- 6) Lattice energy is ______.
- A) the energy required to convert a mole of ionic solid into its constituent ions in the gas phase
- B) the energy given off when gaseous ions combine to form one mole of an ionic solid
- C) the energy required to produce one mole of an ionic compound from its constituent elements in their standard states
- D) the sum of ionization energies of the components in an ionic solid
- E) the sum of electron affinities of the components in an ionic solid

7) In ionic	bond formation, the lattice energy of
ions	as the magnitude of the ion charges
8	nd the radii

- A) increases, decrease, increase
- B) increases, increase, increase
- C) decreases, increase, increase
- D) increases, increase, decrease
- E) increases, decrease, decrease
- 8)The diagram below is the Born-Huber cycle for the formation of crystalline potassium fluoride.



- 8) Which energy change corresponds to the electron affinity of fluorine?
- A) 2
- B) 5
- C) 4
- D) 1
- E) 6
- 9) Which energy change corresponds to the first ionization energy of potassium?
- A) 2
- B) 5
- C) 4
- D) 3
- E) 6
- 10) The electron configuration [Kr]4d¹⁰ represents ______.
- A) Sr+2
- B) Sn+2
- C) Te^{+2}
- D) Ag+1
- E) Rb+1
- 11) Fe⁺² ions are represented by _____.
- A) [Ar]3d1
- B) [Ar]3d4
- C) [Ar]3d6
- D) [Ar]3d104s1
- E) $[Ar]3d^3$

12) Using the Born-Haber cycle, the ΔH_f° of KBr is equal to _____.

A)

$$\Delta H_f^{\circ}[K(g)] + \Delta H_f^{\circ}[Br(g)] + I_1(K) + E(Br) + \Delta H_{lattice}$$

B)
$$\Delta H_f^{\circ}[K(g)] - \Delta H_f^{\circ}[Br(g)] - I_1(K) - E(Br) - \Delta H_{lattice}$$

C)
$$\Delta H_{f} \circ [K(g)] - \Delta H_{f} \circ [Br(g)] + I_{l}(K) - E(Br) + \Delta H_{lattice}$$

D)
$$\Delta H_{f}^{\circ}[K(g)] + \Delta H_{f}^{\circ}[Br(g)] - I_{l} - E(Br) + \Delta H_{lattice}$$

E)
$$\Delta H_f^{\circ}[K(g)] + \Delta H_f^{\circ}[Br(g)] + I_1(K) + E(Br) - \Delta H_{lattice}$$

- 13) The type of compound that is most likely to contain a covalent bond is _____.
- A) one that is composed of a metal from the far left of the periodic table and a nonmetal from the far right of the periodic table
- B) a solid metal
- C) one that is composed of only nonmetals
- D) held together by the electrostatic forces between oppositely charged ions
- E) There is no general rule to predict covalency in bonds.
- 14) In which of the molecules below is the carbon-carbon distance the shortest?
- A) $H_2C = CH_2$
- B) H-C=C-H
- C) H_3C-CH_3
- D) $H_2C = C = CH_2$
- E) $H_3C = CH_2 = CH_3$
- 15) Of the atoms below, ______ is the most electronegative.
- A) Br

Chemistry, 11e (Brown/Lemay/Bursten/Murphy) Chapter 8: Basic Concepts of Chemical Bonding	
B) O	E) Na, Cl
C) Cl D) N	21) Which of the following has the hands correctly
E) F	21) Which of the following has the bonds correctly arranged in order of increasing polarity?
16) Of the atoms below, is the most	A) Be-F, Mg-F, N-F, O-F
electronegative.	B) $O-F$, $N-F$, $Be-F$, $Mg-F$
A) Si	C) $O-F$, $Be-F$, $Mg-F$, $N-F$
B) Cl	D) $N-F$, $Be-F$, $Mg-F$, $O-F$
C) Rb	E) $M - gF$, $Be - F$, $N - F$, $O - F$
D) Ca	
E) S	22) Which two bonds are most similar in polarity?
17) Of the atoms below, is the least	A) O-Fand Cl-F
electronegative.	B) $B-F$ and $Cl-F$
	C) Al-Cland I-Br
A) Rb	D) I – Br and Si – Cl
B) F	E) $Cl-Cl$ and $Be-Cl$
C) Si	0
D) Cl	23) The bond length in an HI molecule is 1.61 Å
E) Ca	and the measured dipole moment is 0.44 D. What
10) ****	is the magnitude (in units of e) of the negative
18) Which of the elements below has the largest	charge on I in HI?
electronegativity?	(1 debye = 3.34×10^{-30} coulomb-meters;;
A) C:	$e=1.6 \times 10^{-19}$ coulombs)
A) Si	
B) Mg C) P	A) 1.6×10^{-19}
D) S	B) 0.057
E) Na	C) 9.1
L) Na	D) 1
19) Of the molecules below, the bond in	E) 0.22
is the most polar.	
is the most polar.	24) Which of the following names is/are correct for
A) HBr	the compound TiO ₂ ?
B) HI	
C) HCl	A) titanium dioxide and titanium (IV) oxide
D) HF	B) titanium (IV) dioxide
E) H ₂	C) titanium oxide
, 2	D) titanium oxide and titanium (IV) dioxide
	E) titanium (II) oxide
20) Of the bonds below, is the least	
polar.	25) Which of the following names is/are correct for
r	the compound SnCl ₄ ?
A) Na, S	•
B) P, S	A) tin (II) chloride and tin (IV) chloride
C) C, F	B) tin tetrachloride and tin (IV) chloride
D) Si, Cl	C) tin (IV) tetrachloride

Chemistry, 11e (Brown/Lemay/Bursten/Murphy)

Chapter 8: Basic Concepts of Chemical Bonding

- D) tin chloride
- E) tin chloride and tin (II) tetrachloride
- 26) The Lewis structure of N_2H_2 shows

- A) a nitrogen-nitrogen triple bond
- B) a nitrogen-nitrogen single bond
- C) each nitrogen has one nonbonding electron pair
- D) each nitrogen has two nonbonding electron
- E) each hydrogen has one nonbonding electron pair
- 27) There are ______ valence electrons in the Lewis structure of CH₃CH₂Cl.
- A) 14
- B) 12
- C) 18
- D) 20
- E) 10
- 28) In the Lewis symbol for a sulfur atom, there are ____ paired and _____ unpaired electrons.
- A) 2, 2
- B) 4, 2
- C) 2, 4
- D) 0, 6
- E) 5, 1
- 29) The Lewis structure of the CO₃²⁻ion is

$$A) \begin{bmatrix} \vdots 0 \vdots \\ \vdots \\ C \\ \vdots \vdots \vdots \vdots \end{bmatrix}^{2}$$

$$A) \begin{bmatrix} \vdots 0 \vdots \\ C \\ \vdots \\ C \\ \vdots \end{bmatrix}^{2}$$

$$B) \begin{bmatrix} \vdots 0 \vdots \\ C \\ \vdots \\ \vdots \end{bmatrix}^{2}$$

- 30) In the nitrite ion (NO_2^-) , _____.
- A) both bonds are single bonds
- B) both bonds are double bonds
- C) one bond is a double bond and the other is a single bond
- D) both bonds are the same
- E) there are 20 valence electrons
- 31) Resonance structures differ by _____.
- A) number and placement of electrons
- B) number of electrons only
- C) placement of atoms only
- D) number of atoms only
- E) placement of electrons only
- 32) The oxidation number of phosphorus in PF3 is

- A) -2
- B) +1
- (C) +3
- D) +2E)-3
- 33) To convert from one resonance structure to another, _____.
- A) only atoms can be moved
- B) electrons and atoms can both be moved

Chemistry, 11e (Brown/Lemay/Bursten/Murphy) Chapter 8: Basic Concepts of Chemical Bonding C) only electrons can be moved	
D) neither electrons nor atoms can be moved	38) A valid Lewis structure of cannot
E) electrons must be added	be drawn without violating the octet rule.
34) For resonance forms of a molecule or ion,	A) NF ₃
·	B) IF ₃
A) one always corresponds to the observed	C) PF ₃
structure D. H. I.	D) SbF ₃
B) all the resonance structures are observed in various proportions	E) So ₄ ²⁻
C) the observed structure is an average of the	39) Based on the octet rule, boron will most likely
resonance forms	form a ion.
D) the same atoms need not be bonded to each other in all resonance forms	
E) there cannot be more than two resonance	A) B3-
structures for a given species	B) B ¹⁺
	C) B ³⁺
For the questions that follow, consider the BEST	D) B ²⁺
Lewis structures of the following oxyanions:	E) B ² -
(i) NO_2^- (ii) NO_3^- (iii) SO_3^{2-} (iv) SO_4^{2-} (v) BrO_3^-	40) Which of the following does <u>not</u> have eight valence electrons?
35) There can be four equivalent best resonance	
structures of	A) Cl-
	B) Xe
A) (ii)	C) Ti+4
B) (iii)	D) Rb+1
C) (i)	E) Sr+1
D) (iv)	,
E) (v)	41) A valid Lewis structure of cannot
26) In which of the ions do all V O hands (V	be drawn without violating the octet rule.
36) In which of the ions do all X-O bonds (X indicates the central atom) have the same length?	A) PO ₄ ³⁻
A) none	B) SiF ₄
B) all	•
C) (i) and (ii)	C) CF ₄
D) (iii) and (v)	D) SeF ₄
E) (iii), (iv), and (v)	E) NF ₃
37) Of the following, cannot	42) The central atom in does not
accommodate more than an octet of electrons.	violate the octet rule.
A) P	A) CE
B) As	A) SF ₄
C) O	B) KrF ₂
D) S	C) CF ₄
E) I	D) XeF ₄

beryllium atom. ### Bit Picture of Linking the octet rule. ### A valid Lewis struct	Chemistry, 11e (Brown/Lemay/Bursten/Murphy) Chapter 8: Basic Concepts of Chemical Bonding	
## Space of the central atom in	-	beryllium atom
43) The central atom in	E) IC1 ₄	•
around beryllium. A) NH₁ B) SeF₂ C) BF₃ D) AsF₃ E) CF₄ 48) Which atom can accommodate an octet of electrons, but doesn't necessarily have to accommodate an octet? 48) Which atom can accommodate an octet of electrons, but doesn't necessarily have to accommodate an octet? 41) A valid Lewis structure of cannot be drawn without violating the octet rule. A) ClF₃ B) CC, C) H D) O E) B C) SO₃ C) SO₃ C) A) always positive B) always negative C) sometimes positive, sometimes negative D) always zero E) unpredictable A) NI₃ B) SO₂ C) ICl₃ C) ICl₃ C) ICl₃ C) ICl₃ C) SO₃ C) S	43) The central atom in violates the	· · · · · · · · · · · · · · · · · · ·
A) NH ₃ B) SeF ₂ C) BF ₃ D) AsF ₄ E) CF ₄ 44) A valid Lewis structure of cannot be drawn without violating the octet rule. A) CIF ₃ B) PCI ₃ C) SO ₃ D) CCI ₄ E) CO ₂ A) always positive drawn without violating the octet rule. A) NI ₃ B) SO ₂ C) ICI ₅ D) SiF ₄ E) CO ₂ A) always zero E) Given that the average bond energies for C-H and C-Br bonds are 413 and 276 kJ/mol, respectively, the heat of atomization of bromoform (CHBr ₃) is kJ/mol. A) NF ₃ B) BeH ₂ C) SO ₃ D) CF ₄ E) SO ₃ C) SO ₃ D) CF ₄ E) SO ₃ C) SO ₃ C) C) C ₄ C) SO ₃ C) C) C ₅ C) So ₅ D) CC ₆ C) So ₆ D) 1378 E) -1378 C) SO ₃ C) Negative of cannot be drawn without violating the octet rule. A) NF ₃ B) BeH ₂ C) SO ₃ C) C-N bond is C) Negative over the date and the Cl atoms in BeCl ₂ ? C) weakest/longest C) weakest/longest C) weakest/longest C) weakest/longest C) weakest/longest C) weakest/longest D) weakest/longest D) weakest/longest D) weakest/longest C) weakest/longest D) weakest/longe		
A) NH ₃ B) SeF ₂ C) BF ₃ D) AsF ₃ E) CF ₄ 44) A valid Lewis structure of cannot be drawn without violating the octet rule. A) CIF ₃ B) PCI ₃ C) SO ₃ D) CCI ₄ E) CO ₂ A) always positive B) always negative C) sometimes positive, sometimes negative D) always zero E) unpredictable A) NI ₃ B) SO ₂ C) ICI ₅ C) SO ₃ A) NF ₃ B) BeH ₂ C) SO ₃ A) NF ₃ B) BeH ₂ C) SO ₃ C) CI ₁ C) SO ₃ C) CI ₁ C) SO ₃ C) CI ₁ C) SO ₃ C) CC ₁ C) CC ₁ C) CC ₁ C) CC ₂ A) 1241 C) SO ₃ C) CR ₃ C) CR ₄ C) SO ₅ C) CR ₅ C) CR ₈ D) 1378 C) CR ₈ C) CR ₈ D) 1378 C) CR ₁ C) SO ₃ C) CR ₁ C) SO ₃ C) CR ₁ C) SO ₃ C) CR ₂ C) So ₃ C) CR ₃ C) So ₃ C) CR ₄ C) SO ₃ C) CR ₅ C) So ₃ C) So ₃ C) So ₃ C) CR ₅ C) So ₃ C) So ₃ C) So ₃ C) So ₃ C) CR ₅ C) So ₃		· · · · · · · · · · · · · · · · · · ·
B) SeF₂ C) BF₃ D) AsF₃ E) CF₄ 48) Which atom can accommodate an octet of electrons, but doesn't necessarily have to accommodate an octet? 48) A valid Lewis structure of cannot be drawn without violating the octet rule. 49) B C C) H D) O E) B C) SO₃ D) CCI₄ E) CO₂ A) always positive B) always negative C) sometimes positive, sometimes negative D) always zero E) unpredictable 50) Given that the average bond energies for C-H and C-Br bonds are 413 and 276 kJ/mol, respectively, the heat of atomization of bromoform (CHBr₃) is kJ/mol. 6) CO₂ A) 1241 B) 689 C) -689 D) 1378 E) -1378 B) BeI¹₂ C) SO₃² D) CF₄ E) SO₃² C) No dispensive sometimes negative D) always zero E) unpredictable 50) Given that the average bond energies for C-H and C-Br bonds are 413 and 276 kJ/mol, respectively, the heat of atomization of bromoform (CHBr₃) is kJ/mol. 50) Given that the average bond energies for C-H and C-Br bonds are 413 and 276 kJ/mol, respectively, the heat of atomization of bromoform (CHBr₃) is kJ/mol. 50) Given that the average bond energies for C-H and C-Br bonds are 413 and 276 kJ/mol, respectively, the heat of atomization of bromoform (CHBr₃) is kJ/mol. 50) Given that the average bond energies for C-H and C-Br bonds are 413 and 276 kJ/mol, respectively, the heat of atomization of bromoform (CHBr₃) is kJ/mol. 50) Given that the average bond energies for C-H and C-Br bonds are 413 and 276 kJ/mol, respectively, the heat of atomization of bromoform (CHBr₃) is kJ/mol. 51) 1378 62) -1378 63) 1378 64) A valid Lewis structure of cannot be drawn without violating the octet rule. 63) A valid Lewis structure of cannot be drawn without violating the octet rule. 64) A valid Lewis structure of cannot be drawn without violating the octet rule. 65) Given that the average bond energies for C-H and C-Br bonds are 413 and 276 kJ/mol, respectively, the heat of atomization of bromoform (CHBr₃) is	A) NH ₃	
C) BF ₃ D) AsF ₄ E) CF ₄ 48) Which atom can accommodate an octet of electrons, but doesn't necessarily have to accommodate an octet? 44) A valid Lewis structure of cannot be drawn without violating the octet rule. A) ClF ₃ B) C C) H D) O B) PCl ₃ C) SO ₃ D) CCl ₄ E) CO ₂ A) always positive B) always negative C) sometimes positive, sometimes negative D) always zero E) unpredictable A) NI ₃ B) SO ₂ C) ICl ₃ D) SiF ₄ C) CO ₂ A) 1241 B) 689 C) -689 D) 1378 E) -1378 A) NF ₃ B) BeH ₂ C) SO ₃ C) CP ₄ C) SO ₃ C) CP ₄ C) SO ₃ C) CP ₄ C) SO ₃ C) Of the bonds C-N,C=N, and C=N, the C-N bond is A) strongest/longest C) weakest/shortest D) weakest/longest E) intermediate in both strength and length Contact of the content with a content with a content with a content of the content with a content with a content of the content with a content of the content of the content with a content of the content with a content with a content of the content with a content	B) SeF ₂	_
A8) Which atom can accommodate an octet of electrons, but doesn't necessarily have to accommodate an octet? 44) A valid Lewis structure of cannot be drawn without violating the octet rule. A) CIF ₃	2	adding up to zero.
E) CF₂ 44) A valid Lewis structure of cannot be drawn without violating the octet rule. A) N B) C C) H D) O E) B C) SO₃ D) CCl₄ E) CO₂ A) always positive B) always negative C) sometimes positive, sometimes negative D) always zero E) unpredictable A) NI₃ B) SO₂ C) ICl₃ C)	3	48) Which atom can accommodate an octet of
44) A valid Lewis structure of cannot be drawn without violating the octet rule. A) CIF ₃ B) PCI ₃ C) SO ₃ D) CCI ₄ E) CO ₂ 45) A valid Lewis structure of cannot be drawn without violating the octet rule. A) NI ₃ B) SO ₂ C) ICI ₅ C) ICI	3	
be drawn without violating the octet rule. A) CIF ₃ B) PC1 C) H B) PC1 C) SO ₃ D) CCl ₄ E) CO ₂ A) always positive B) always negative C) sometimes positive, sometimes negative D) always zero E) unpredictable A) NI ₁ B) SO ₂ C) ICl ₅ C) ICl ₈ C) ICl ₈ C) ICl ₈ C) ICl ₉ C) I	E) Cr ₄	accommodate an octet?
be drawn without violating the octet rule. $(C) H$ A) CIF ₃ B) PCI ₃ C) SO ₃ D) CCI ₄ E) CO ₂ A) always positive B) always negative C) sometimes positive, sometimes negative D) always zero E) unpredictable A) NI ₃ B) SO ₂ C) ICI ₅ C) ICI ₆ C) ICI ₇ C) ICI ₈ C) ICI ₉ C) IC	44) A valid Lewis structure of cannot	A) N
A) CIF ₃ B) PCl ₃ C) SO ₃ D) CCl ₄ E) CO ₂ A) always positive B) always negative C) sometimes positive, sometimes negative D) always zero E) unpredictable A) NI ₃ B) SO ₂ C) ICl ₅ C) ICl ₅ C) SIF ₄ E) CO ₂ A) 1241 B) 689 C) -689 D) 1378 E) -1378 A) NF ₃ B) BeH ₂ C) SO ₂ D) CF ₄ E) SO ₂ C-N bond is A) strongest/shortest B) strongest/longest C) weakest/shortest B) strongest/longest C) weakest/shortest B) strongest/longest C) weakest/shortest D) weakest/longest C) weakest/longest C) weakest/shortest D) weakest/longest C) weakest/shortest D) weakest/longest D)		•
B) PCl ₃ C) SO ₃ D) CCl ₄ E) CO ₂ A) always positive B) always negative C) sometimes positive, sometimes negative D) always zero E) unpredictable A) NI ₃ B) SO ₂ C) ICl ₅ C) ICl ₅ C) ICl ₅ C) SO ₂ A) 1241 B) 689 C) -689 B) always recroin that the average bond energies for C-H and C-Br bonds are 413 and 276 kJ/mol, respectively, the heat of atomization of bromoform (CHBr ₅) iskJ/mol. E) CO ₂ A) 1241 B) 689 C) -689 D) 1378 E) -1378 A) NF ₃ B) BeH ₂ C) SO ₂ D) CF ₄ E) SO ₃ ² D) CF ₄ E) SO ₃ ² A) Strongest/shortest B) strongest/longest C) weakest/shortest B) strongest/longest C) weakest/shortest B) strongest/longest C) weakest/shortest D) weakest/longest E) intermediate in both strength and length 52) As the number of covalent bonds between two terms in generous the atoms and the clustone between two terms in generous the atoms and the clustone between two terms in generous the dicture of the strength and length		C) H
C) SO ₃ D) CCl ₄ E) CO ₂ A) always positive B) always negative C) sometimes positive, sometimes negative D) always zero E) unpredictable A) NI ₃ B) SO ₂ C) ICl ₅ C) ICl ₅ C) SIF ₄ E) CO ₂ A) 1241 B) 688 C) C-89 D) 1378 E) -1378 A) NF ₃ B) BeH ₂ C) SO ₂ D) CF ₄ E) SO ₃ ² C) SO ₂ D) CF ₄ E) SO ₃ ² A) That would give positive formal charges to the A) NF ₃ to a survey and charges to the street are account to the atom and the Cl atoms in BeCl ₂ ? A) That would give positive formal charges to the A) A valid Lewis structure of cannot be atom and the Cl atoms in BeCl ₂ ? A) That would give positive formal charges to the	A) ClF ₃	· · · · · · · · · · · · · · · · · · ·
D) CCl ₄ E) CO ₂ 45) A valid Lewis structure of cannot be drawn without violating the octet rule. A) NI ₃ B) SO ₂ C) Given that the average bond energies for C-H and C-Br bonds are 413 and 276 kJ/mol, respectively, the heat of atomization of bromoform (CHBr ₃) is kJ/mol. E) CO ₂ 46) A valid Lewis structure of cannot be drawn without violating the octet rule. A) NF ₃ B) BeH ₂ C) SO ₂ C-N bond is A) strongest/shortest B) strongest/longest C) weakest/longest C) weakest/longest E) intermediate in both strength and length 52) As the number of covalent bonds between two target increases the distance hattreage the total content to the content to th	B) PCl ₃	E) B
D) CCl ₄ E) CO ₂ 45) A valid Lewis structure of cannot be drawn without violating the octet rule. A) NI ₃ B) SO ₂ C) Given that the average bond energies for C-H and C-Br bonds are 413 and 276 kJ/mol, respectively, the heat of atomization of bromoform (CHBr ₃) is kJ/mol. E) CO ₂ 46) A valid Lewis structure of cannot be drawn without violating the octet rule. A) NF ₃ B) BeH ₂ C) SO ₂ C-N bond is A) strongest/shortest B) strongest/longest C) weakest/longest C) weakest/longest E) intermediate in both strength and length 52) As the number of covalent bonds between two target increases the distance hattreage the total content to the content to th	C) SO ₃	40) Rond anthalog is
E) CO_2 45) A valid Lewis structure of cannot be drawn without violating the octet rule. A) NI_3 B) SO_2 C) ICl_5 C)		49) Bond enthalpy is
B) always negative C) sometimes positive, sometimes negative D) always zero E) unpredictable A) NI ₃ B) SO ₂ C) ICl ₅ C) ICl ₅ C) ICl ₅ C) ICl ₅ C) Sometimes positive, sometimes negative D) always zero E) unpredictable 50) Given that the average bond energies for C-H and C-Br bonds are 413 and 276 kJ/mol, respectively, the heat of atomization of bromoform (CHBr ₃) iskJ/mol. E) CO ₂ A) 1241 B) 689 C) -689 D) 1378 E) -1378 A) NF ₃ B) BeH ₂ C) SO ₂ C-N bond is C-N bond is A) strongest/shortest E) SO ₃ ²⁻ B) strongest/longest C) weakest/shortest D) weakest/longest E) intermediate in both strength and length 52) As the number of covalent bonds between twe trees inversees the dictages between the content and the clausers are the strong through		A) always positive
be drawn without violating the octet rule. D) always zero E) unpredictable A) NI_3 B) SO_2 C) ICI_5 D) Given that the average bond energies for C-H and C-Br bonds are 413 and 276 kJ/mol, respectively, the heat of atomization of bromoform (CHBr $_3$) iskJ/mol. E) CO_2 A) 1241 B) 689 C) -689 D) 1378 E) -1378 A) NF_3 B) BeH_2 C) SO_2 D) CF_4 E) SO_3^{2-} D) CF_4 E) SO_3^{2-} Cannot be drawn without violating the octet rule. A) $C = N$, and $C = N$, the $C = N$ and $C = N$	_, _ , _ ,	B) always negative
be drawn without violating the octet rule. E) unpredictable A) NI_3 50) Given that the average bond energies for C-H and C-Br bonds are 413 and 276 kJ/mol, respectively, the heat of atomization of bromoform (CHBr ₃) iskJ/mol. E) CO_2 A) 1241 B) 689 C) -689 be drawn without violating the octet rule. A) NF_3 E) -1378 E) -1378 B) BeH_2 C) SO_2 C-N bond is D) CF_4 E) SO_3^{2-} B) strongest/shortest B) strongest/longest C) weakest/shortest D) weakest/longest E) intermediate in both strength and length A) That would give positive formal charges to the	45) A valid Lewis structure of cannot	
A) NI ₃ B) SO ₂ C) ICl ₅ D) SiF ₄ E) CO ₂ 46) A valid Lewis structure of cannot be drawn without violating the octet rule. A) NF ₃ B) BeH ₂ C) SO ₂ C) CF ₄ E) SO ₃ ²⁻ D) CF ₄ E) SO ₃ ²⁻ A) That would give positive formal charges to the SO Given that the average bond energies for C-H and C-Br bonds are 413 and 276 kJ/mol, respectively, the heat of atomization of bromoform (CHBr ₃) is kJ/mol. SO GIVEN that the average bond energies for C-H and C-Br bonds are 413 and 276 kJ/mol, respectively, the heat of atomization of bromoform (CHBr ₃) is kJ/mol. SO GIVEN that the average bond energies for C-H and C-Br bonds are 413 and 276 kJ/mol, respectively, the heat of atomization of bromoform (CHBr ₃) is kJ/mol. SO GIVEN that the average bond energies for C-H and C-Br bonds are 413 and 276 kJ/mol, respectively, the heat of atomization of bromoform (CHBr ₃) is kJ/mol. SO GIVEN that the average bond energies for C-H and C-Br bonds for C-Br bonds for C-Br bonds for C-Br bonds is SO GIVEN that the average bond energies for C-H and C-Br bonds for C-H and C-Br bonds for		
B) SO_2 and C-Br bonds are 413 and 276 kJ/mol, respectively, the heat of atomization of bromoform $(CHBr_3)$ is kJ/mol. E) CO_2 A) 1241 B) 689 C) -689 D) 1378 E) -1378 A) NF_3 E) -1378 B) BeH_2 C1 SO2 C-N bond is D) CF_4 C2 SO3 C-N bond is D) CF_4 A) strongest/shortest E) SO_3^{2-} B) strongest/longest C) weakest/shortest D) weakest/longest C) weakest/shortest D) weakest/longest E) intermediate in both strength and length S2) As the number of covalent bonds between two stores increases the distance between the stores increases the distance between two stores in stores and the content in the atomic and charges to the stores in stores and the content in the atomic and charges to the stores in the s		E) unpredictable
B) SO_2 and C-Br bonds are 413 and 276 kJ/mol, respectively, the heat of atomization of bromoform $(CHBr_3)$ is kJ/mol. E) CO_2 A) 1241 B) 689 C) -689 D) 1378 E) -1378 A) NF_3 B) BeH_2 51) Of the bonds $C-N, C=N$, and $C=N$, the C SO_2 C-N bond is D) CF_4 A) strongest/shortest E) SO_3^{2-} B) strongest/longest C) weakest/shortest D) weakest/longest C) weakest/shortest D) weakest/longest E) intermediate in both strength and length A) That would give positive formal charges to the	A) NI ₃	50) Given that the average bond energies for C-H
C) ICl_5 respectively, the heat of atomization of bromoform $(CHBr_3)$ is kJ/mol. E) CO_2 A) 1241 B) 689 C) -689 D) 1378 E) -1378 A) NF_3 B) BeH_2 51) Of the bonds C - N , $C = N$, and $C = N$, the C) SO_2 C- N bond is D) CF_4 E) SO_3^{2-} B) strongest/shortest E) SO_3^{2-} B) strongest/longest C) weakest/shortest D) weakest/longest C) weakest/shortest D) weakest/longest E) intermediate in both strength and length A) That would give positive formal charges to the	B) SO ₂	· · · · · · · · · · · · · · · · · · ·
D) SiF_4 E) CO_2 A) 1241 B) 689 C) -689 be drawn without violating the octet rule. A) NF_3 B) BeH_2 C) SO_2 D) CF_4 E) SO_3^{2-} D) CF_4 E) SO_3^{2-} C) CF_4 E) SO_3^{2-} A) SF_4 C) SO_2 D) CF_4 E) SO_3^{2-} A) SF_4 A) SF_5 B) SF_6 C-N bond is A) SF_6 B) SF_6 C) weakest/shortest C) weakest/longest C) weakest/longest C) weakest/longest C) weakest/longest E) intermediate in both strength and length A) That would give positive formal charges to the	C) ICl _s	
E) CO_2 46) A valid Lewis structure of cannot be drawn without violating the octet rule. A) 1241 B) 689 C) -689 D) 1378 E) -1378 A) NF_3 B) BeH_2 51) Of the bonds $C-N, C = N$, and $C = N$, the C) SO_2 C-N bond is D) CF_4 E) SO_3^{2-} A) strongest/shortest B) strongest/longest C) weakest/shortest D) weakest/longest E) intermediate in both strength and length A) That would give positive formal charges to the	3	(CHB r_3) is kJ/mol.
46) A valid Lewis structure of cannot be drawn without violating the octet rule. A) 1241 B) 689 C) -689 D) 1378 E) -1378 A) NF_3 B) BeH_2 C) SO_2 C-N bond is A) strongest/shortest B) strongest/longest C) weakest/shortest D) weakest/longest C) weakest/longest E) SO_3^{2-} D) SO_3^{2-} E) intermediate in both strength and length A) That would give positive formal charges to the Solve the distance between two strong increases the distance between the strong increases the distance between two strong increases.	·	
46) A valid Lewis structure of cannot be drawn without violating the octet rule. C) -689 D) 1378 E) -1378 A) NF ₃ B) BeH ₂ C) SO ₂ C-N bond is D) CF ₄ E) SO ₃ ²⁻ B) strongest/shortest B) strongest/longest C) weakest/shortest D) weakest/shortest D) weakest/longest E) intermediate in both strength and length A) That would give positive formal charges to the	L) CO ₂	•
be drawn without violating the octet rule. D) 1378 E) -1378 A) NF ₃ B) BeH ₂ C) SO ₂ C-N bond is D) CF ₄ E) SO ₃ ² B) strongest/shortest C) weakest/shortest C) weakest/shortest D) weakest/longest C) weakest/longest E) intermediate in both strength and length A) That would give positive formal charges to the C) SO ₃ C-N bond is A) strongest/longest C) weakest/longest E) intermediate in both strength and length 52) As the number of covalent bonds between two storms increases, the dictance between two storms increases, the dictance between the storms increases.	46) A valid Lewis structure of cannot	·
A) NF ₃ B) BeH ₂ C) SO ₂ D) CF ₄ E) SO ₃ ²⁻ E) So ₃ ²⁻ B) strongest/shortest B) strongest/longest C) weakest/shortest D) weakest/shortest D) weakest/longest C) weakest/longest E) intermediate in both strength and length A) That would give positive formal charges to the E) -1378 E) -1378 C-N bond is A) strongest/shortest D) weakest/longest E) intermediate in both strength and length		•
A) NF_3 B) BeH_2 C) SO_2 D) CF_4 E) SO_3^{2-} B) SO_3^{2-} C) SO_3^{2-} C) SO_3^{2-} B) SO_3^{2-} C) SO_3^{2-} C) SO_3^{2-} B) SO_3^{2-} C) SO_3^{2-} C) SO_3^{2-} B) SO_3^{2-} C) SO_3^{2-}	of drawn without violating the office rate.	•
C) SO ₂ D) CF ₄ E) SO ₃ ²⁻ A) strongest/shortest B) strongest/longest C) weakest/shortest D) weakest/longest D) weakest/longest E) intermediate in both strength and length A) That would give positive formal charges to the	A) NF ₃	E)-1376
C) SO ₂ D) CF ₄ E) SO ₃ ²⁻ A) strongest/shortest B) strongest/longest C) weakest/shortest D) weakest/longest D) weakest/longest E) intermediate in both strength and length A) That would give positive formal charges to the	B) BeH ₂	51) Of the bonds $C-N, C = N$, and $C \equiv N$, the
D) CF ₄ E) SO ₃ ²⁻ A) strongest/shortest B) strongest/longest C) weakest/shortest D) weakest/longest E) intermediate in both strength and length A) That would give positive formal charges to the	C) SO ₂	
E) SO ₃ ²⁻ B) strongest/longest C) weakest/shortest D) weakest/longest E) atom and the Cl atoms in BeCl ₂ ? E) intermediate in both strength and length A) That would give positive formal charges to the	· · · · · · · · · · · · · · · · · · ·	
C) weakest/shortest 47) Why don't we draw double bonds between the Be atom and the Cl atoms in BeCl ₂ ? D) weakest/longest E) intermediate in both strength and length 52) As the number of covalent bonds between two atoms increases, the distance between two atoms increases, the distance between the atoms.	7	· · · · · · · · · · · · · · · · · · ·
47) Why don't we draw double bonds between the Be atom and the Cl atoms in BeCl ₂ ? D) weakest/longest E) intermediate in both strength and length 52) As the number of covalent bonds between two atoms increases, the distance between the atoms increases, the distance between the atoms.	E) 50 ₃	
Be atom and the Cl atoms in BeCl ₂ ? E) intermediate in both strength and length A) That would give positive formal charges to the	47) Why don't we draw double bonds between the	,
A) That would give positive formal charges to the 52) As the number of covalent bonds between two stores increases, the distance between the stores	· · · · · ·	·
A) That would give positive formal charges to the	be atom and the Ci atoms in becig!	2, memorace in both strength and length
otoma increases, the dictance hetricen the etems	A) That would give positive formal charges to the	52) As the number of covalent bonds between two
	· · · · · · · · · · · · · · · · · · ·	atoms increases, the distance between the atoms

Chemistry, 11e (Brown/Lemay/Bursten/Murphy) Chapter 8: Basic Concepts of Chemical Bonding and the strength of the bond between	: Ċl .
them	the Lewis symbol, — is
A) increases, increases B) decreases, decreases C) increases, decreases D) decreases, increases	2) Write the balanced chemical equation for the reaction for which ΔH°_{rxn} is the lattice energy for potassium bromide.
E) is unpredictable53) Of the possible bonds between carbon atoms	3) Using the noble gas shorthand notation, write the electron configuration for Fe ⁺³ .
(single, double, and triple),	4) Give the electron configuration of Cu ²⁺ .
 A) a triple bond is longer than a single bond B) a double bond is stronger than a triple bond C) a single bond is stronger than a triple bond D) a double bond is longer than a triple bond 	5) Which halogen, bromine or iodine, will form the more polar bond with phophorus?
E) a single bond is stronger than a double bond	6) Draw the Lewis structure of ICl ₂ +.
54) Most explosives are compounds that decompose rapidly to produce products and a great deal of	7) Alternative but equivalent Lewis structures are called
A) gaseous, gases B) liquid, heat	8) Benzene is an compound with equivalent Lewis structures.
C) soluble, heat D) solid, gas E) gaseous, heat	9) In a reaction, if the bonds in the reactants are stronger than the bonds in the product, the reaction is
55) Dynamite consists of nitroglycerine mixed with	10) In compounds of and, the octet rule is violated due to the presence of fewer than eight valence electrons.
A) potassium nitrate B) damp KOH C) TNT	11) Polyatomic ions with an odd number of electrons will the octet rule.
D) diatomaceous earth or cellulose E) solid carbon	12) The strength of a covalent bond is measured by its
56) Dynamite	13) To produce maximum heat, an explosive
A) was invented by Alfred NobelB) is made of nitroglycerine and an absorbent such as diatomaceous earthC) is a much safer explosive than pure	compound should have chemical bonds and decompose to molecule with bonds.
nitroglycerine D) is an explosive E) all of the above	14) Calculate the bond energy of C-F given that the heat of atomization of CHFClBr is 1502 kJ/mol, and that the bond energies of C-H, C-Br, and C-Cl are 413, 276, and 328 kJ/mol, respectively.
8.3 Short Answer Questions1) The electron configuration that corresponds to	15) The reaction below is used to produce

$$CO(g) + 2H_2 (g) \rightarrow CH_3OH (l)$$

 $\Delta H_{rxn} = -128KJ$

(a) Calculate the C-H bond energy given the following data:

Bond	D (kJ/mol)
C≡O	1072
H-H	436
C-O	358
O-H	463

- (b) The tabulated value of the (C-H) bond energy is 413 kJ/mol. Explain why there is a difference between the number you have calculated in (a) and the tabulated value.
- 16) From the information given below, calculate the heat of combustion of methane (CH₄)(in kj/mol) Start by writing the balanced equation.

Bond	D (kJ/mol)
C-H	413
0=0	495
C=O	799
O-H	463

8.4 True/False Questions

- 1) Atoms surrounded by eight valence electrons tend to lose electrons.
- 2) The greater the lattice energy, the greater the charges on the participatory ions and the smaller their radii.
- 3) Most transition metals do not form ions with a noble gas configuration.
- 4) When a metal gains an electron, the process is endothermic.
- 5) Electron affinity is a measure of how strongly an atom can attract additional electrons.

- 6) As electronegativity difference increases, bond length will decrease.
- 7) In some molecules and polyatomic ions, the sum of the valence electrons is odd and as a result the octet rule fails.
- 8) Bond enthalpy can be positive or negative.