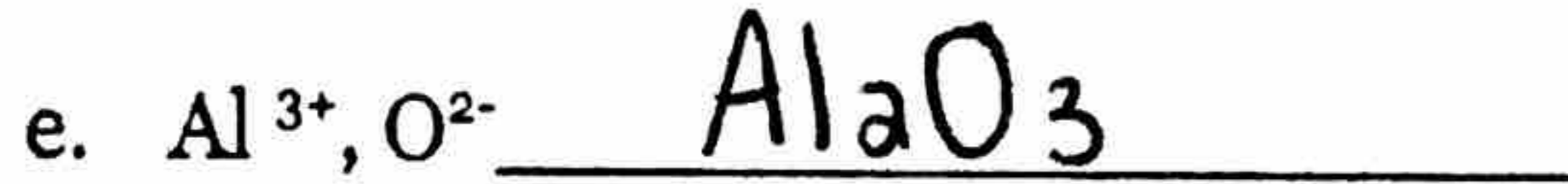
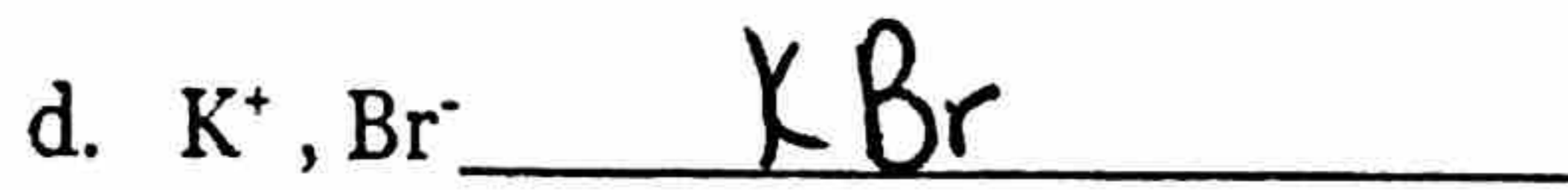
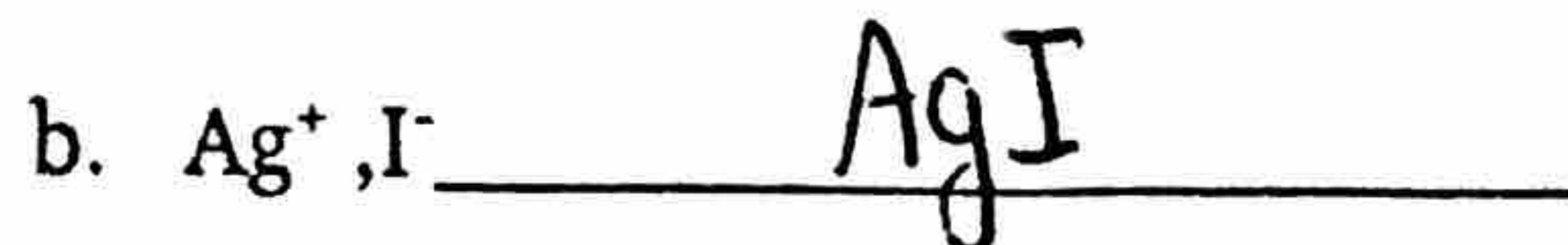
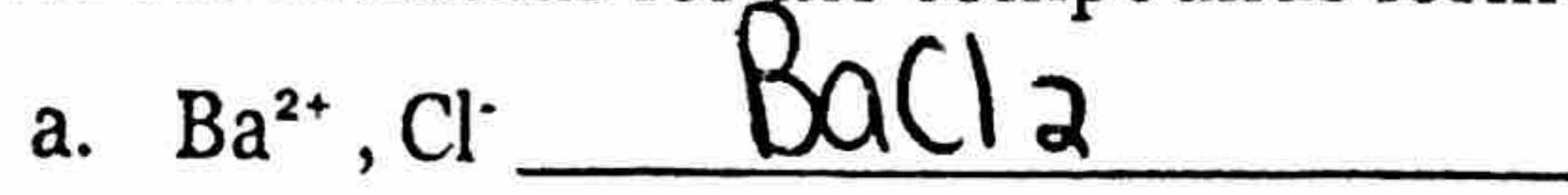


Bonding & Reactions Test Review

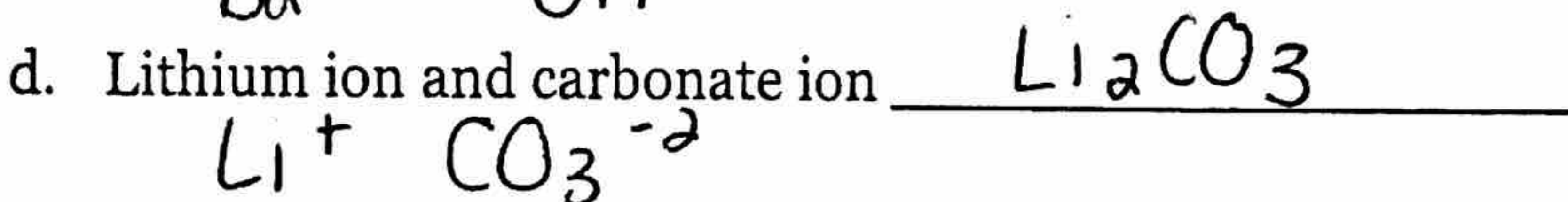
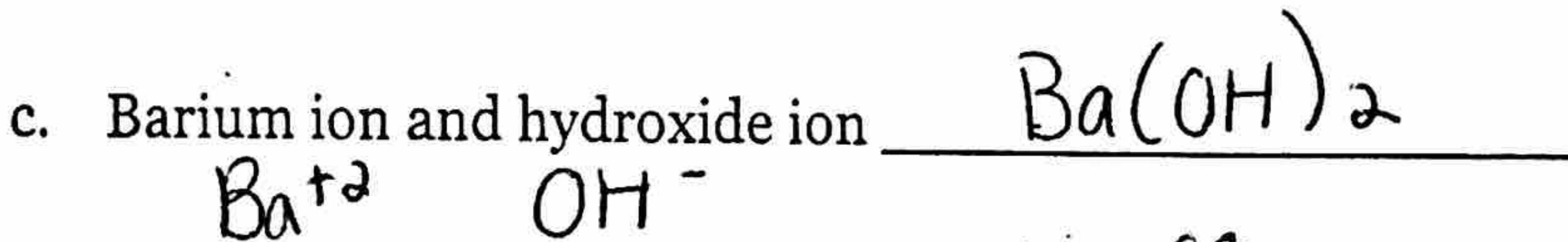
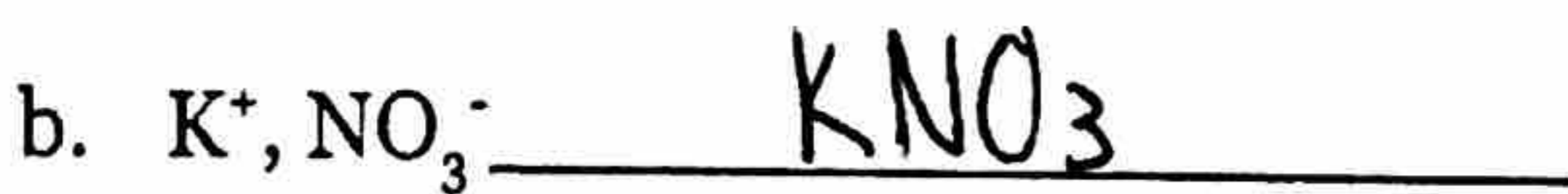
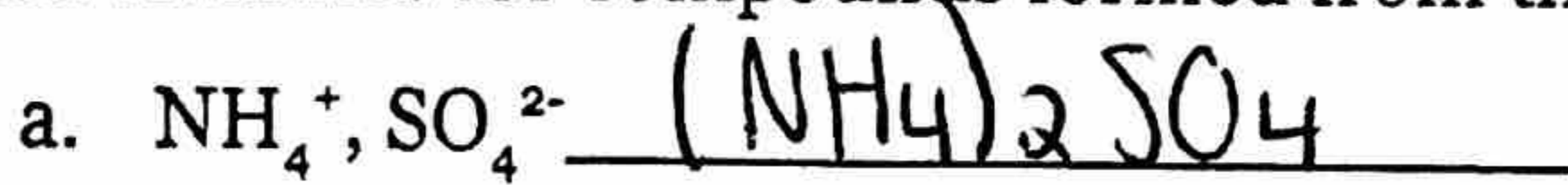
Name: Key

1. Write the formulas for the compounds formed from these pairs of ions.

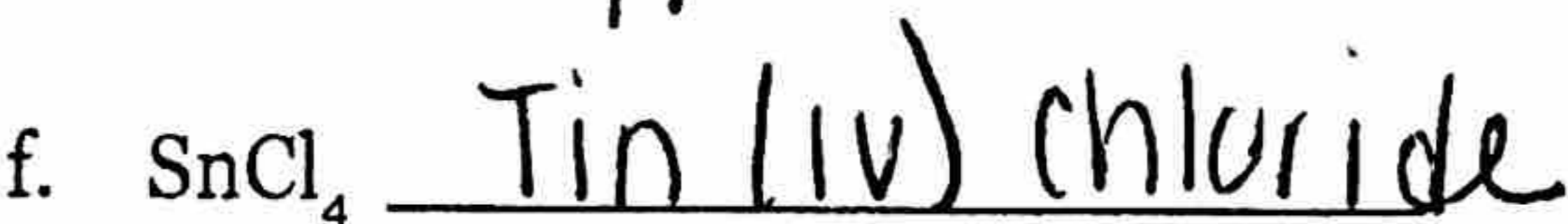
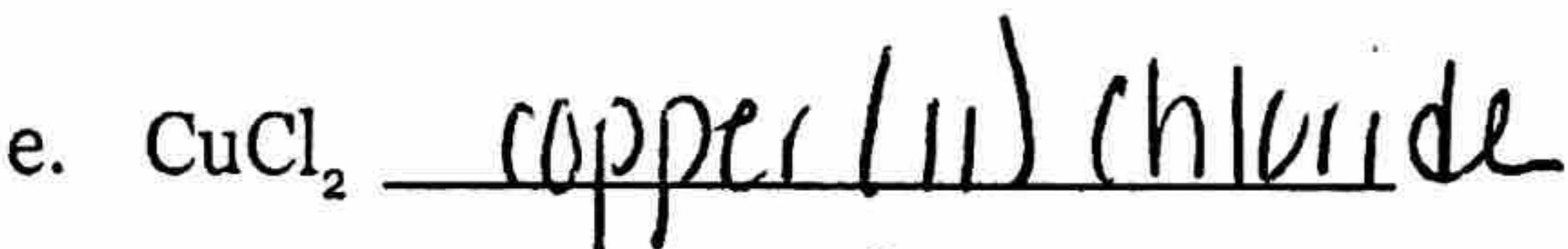
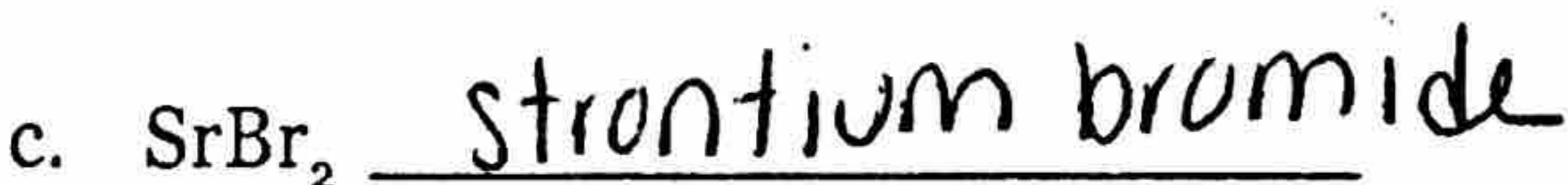
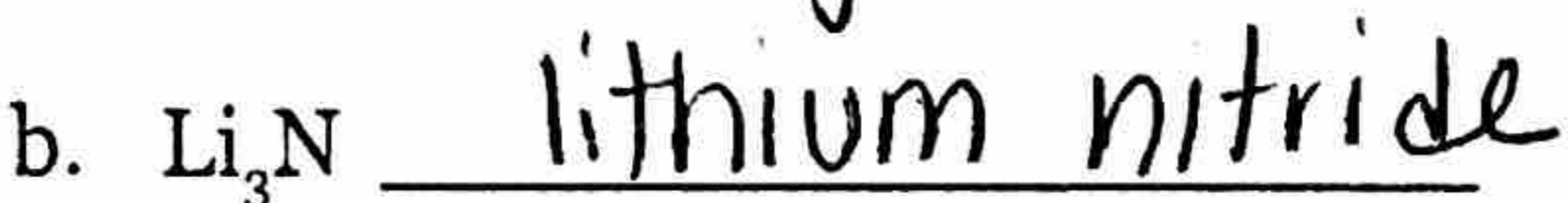
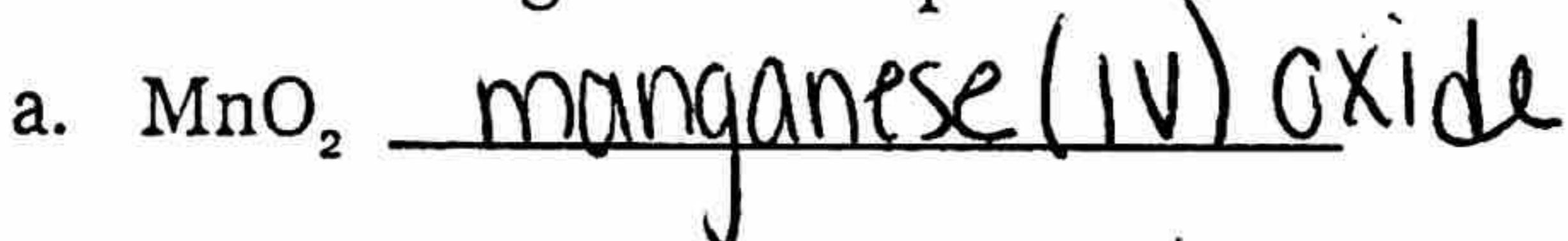


* for ionic compounds,
remember to reduce
subscripts *
ex. $\text{Ca}_2\text{S}_2 \rightarrow \text{CaS}$

2. Write formulas for compounds formed from these pairs of ions.



3. Name the following ionic compounds.



* remember to ask yourself
→ is the metal in
group 1, 2, 3, Zn, or Ag *

4. Write formulas for the following ionic compounds.



* write the ions, crisscross
charges *

- d. potassium cyanide KCN
e. ammonium chloride NH₄Cl
f. potassium dichromate K₂Cr₂O₇

5. Name the following acids.

- a. HCN cyanic acid
b. HClO₃ chloric acid
c. H₂SO₄ sulfuric acid
d. H₂CO₃ carbonic acid
e. H₃PO₄ phosphoric acid
f. HNO₃ nitric acid

6. Name the following covalent compounds.

- a. PCl₅ phosphorus pentachloride
b. CCl₄ carbon tetrachloride
c. NO₂ nitrogen dioxide
d. XeF₂ xenon difluoride
e. SiO₂ silicon dioxide
f. Cl₂O₇ dichlorine heptoxide

7. Write the formulas for the following covalent compounds.

- a. nitrogen tribromide NBr₃
b. dichlorine monoxide Cl₂O
c. sulfur dioxide SO₂
d. dinitrogen tetrafluoride N₂F₄

8. Write the formulas for the following acids.

a. Sulfurous acid H_2SO_3

b. Bromic acid $HBrO_3$

c. Chromic acid H_2CrO_4


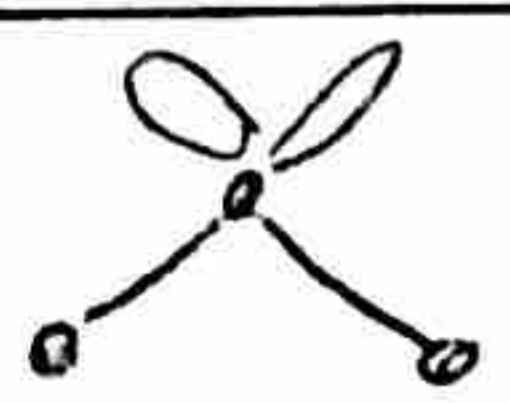

d. Hydroiodic acid HI

e. Hypochlorous acid $HClO$

Bonding Properties

Property	Ionic	Covalent	Metals
Luster			✓
Malleability			✓
Ductility			✓
Melting Point	high	low	mostly high
Solubility	yes	usually no	No
Ability to conduct electricity as solid	No	No	yes
Ability to conduct electricity as liquid	yes	No	yes
Use of electrons in bonding	transfer	sharing	sea of electrons

Lewis Structure & VSEPR Theory Complete the following charts:

Shape	Bonded Atoms	Lone Pairs	Sketch of Shape
Linear	$\begin{array}{c c} 1 & 1 \\ \hline 2 & \\ \hline 1 & 2 \end{array}$	$\begin{array}{c c} 0 & 2 \\ \hline 0 & 3 \\ \hline 1 & 3 \end{array}$	
Bent	$2/2$	$1/2$	
Trigonal Planar	3	0	

Bonding Properties

Property	Ionic	Covalent	Metals
Luster			✓
Malleability			✓
Ductility			✓
Melting Point	high	low	usually high
Solubility	yes	sometimes	NO
Ability to conduct electricity as solid	NO	NO	yes
Ability to conduct electricity as liquid	yes	NO	yes
Use of electrons in bonding	transfer	share	sea of electrons

Lewis Structure & VSEPR Theory

Complete the following charts:

Shape	Bonded Atoms		Lone Pairs		Sketch of Shape
Linear	1 2 1	1 1 2	0 0 1	2 3 3	
Bent	2 2		1 2		
Trigonal Planar	3		0		
Trigonal Pyramidal	3		1		
Tetrahedral	4		0		
Trigonal bipyramidal	5		0		
See Saw	4		1		

T Shape	3	2	
Octahedral	6	0	
Square pyramidal	5	1	
Square planar	4	2	

Compound	Formula	Lewis Structure	Bonded Atoms	Lone Pairs	Shape	P / NP
8. boron tribromide Val e- <u>24</u>	BBr_3		3	0	trigonal planar	NP
9. Carbon dioxide Val e- <u>16</u>	CO_2		2	0	linear	NP
10. Water Val e- <u>8</u>	H_2O		2	2	bent	P
11. Silicon tetrachloride Val e- <u>32</u>	$SiCl_4$		4	0	tetrahedral	NP
12. Phosphorus trihydride Val e- <u>8</u>	PH_3		3	1	trigonal pyramid	P
13. chlorine Val e- <u>14</u>	Cl_2		1	3	linear	NP

all diatomics are nonpolar

Arsenic pentafluoride Val e- 40	AsF_5		5	0	trigonal bipyramid	NP
15. Phosphate ion Val e- 32	PO_4^{-3}		4	0	tetrahedral	NP
16. Sulfur hexahydride Val e- 12	SH_6		6	0	octahedral	NP
17. Selenium hexachloride Val e- 48	$SeCl_6$		6	0	octahedral	NP
18. Iodine pentafluoride Val e- 42	IF_5		5	0	trigonal square pyramid	P
19. Krypton tetrabromide Val e- 36	$KrBr_4$		4	2	square planar	P

Review Material that will also be tested on: Each test will have a few review questions on it that relate to topics from previous units. The review sheet will have these topics outlined and some practice problems on it to refresh your memory.

Topic 1: Summarize that the reactivity increases down a group for metals

<https://tinyurl.com/y9xw5ubw>

1. Which metal on the periodic table is most reactive? Francium
2. Arrange the following metals in order of most reactive to least reactive:

K, Li, Rb Rb, K, Li

3. Arrange the following metals in order of least reactive to most reactive:

Ba, Ca, Sr Ca, Sr, Ba

Topic 2: Be able to identify the number of valence electrons in an electron configuration

<https://tinyurl.com/jbmatlt>

<https://tinyurl.com/z379n2h>

1. How many valence electrons are in the following electron configuration?

a. ~~$1s^2 2s^2 2p^6 3s^1$~~ 1 $1s^2 2s^2 2p^6 3s^2 3p^6 4s^1$

b. ~~$1s^2 2s^2 2p^6 3s^2 3p^5$~~ 7 $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 4p^5$
 $3d^{10}$

c. ~~$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^7$~~ 2 $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^7$

Topic 3: Predict the number of electrons lost or gained based off of an electron configuration.

1. Write the name of the noble gas that is closest to each of the previous elements (topic 2) and how many electrons it would have to gain or lose to get to that noble gas. (remember to be looking at the valence electrons)

a. Ar lose 1

b. Kr gain 1

c. _____ lose 2

N/A
for transition
metals

2. Write the symbol with the charge of each of the previous elements.

a. K^{+1}

b. Br^{-1}

c. Co^{+2}