Chemistry

Ionic Bonding Practice

Grade 10 Science

Ionic Compounds

Ionic compounds are chemical compounds in which ions are held together in a lattice structure by ionic bonds — the electrostatic force between positively charged cations and negatively charged anions. Ionic compounds have high melting and boiling points, and they are hard and very brittle. They are also called salts.

Inside:

Chemistry

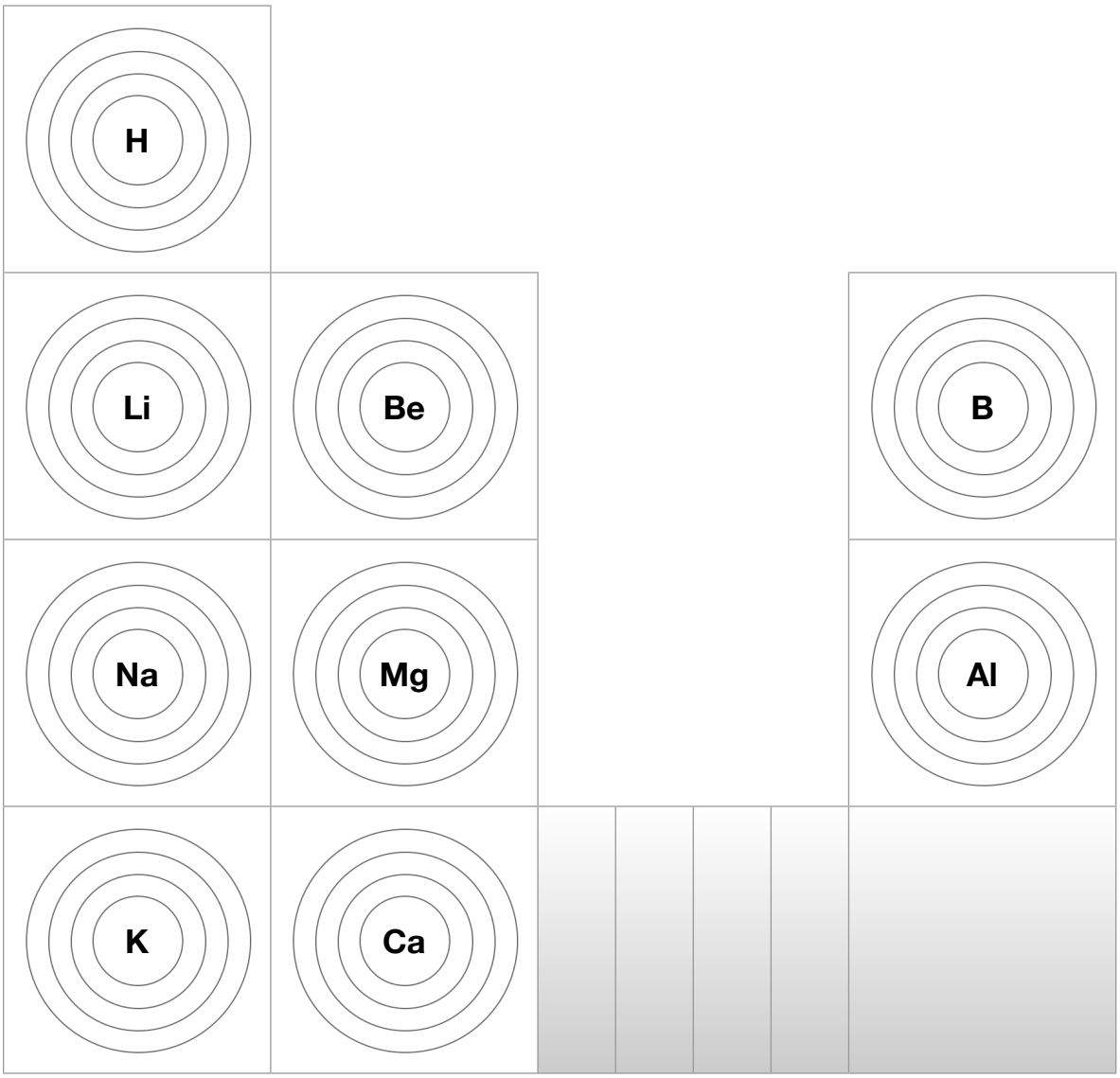
Bohr-Rutherford diagrams

Instructions

Complete Bohr-Rutherford diagrams of the first 20 elements, drawing the electrons as open circles: ○.

The electrons in the inner shells are strongly bound to the nucleus. The ion will retain these. Colour them **black**.

The electrons in the outer shell may be lost. If the shell is less than half full the ion will lose these electrons. Colour them **red**. If the outer electrons are not lost, colour them **blue**.

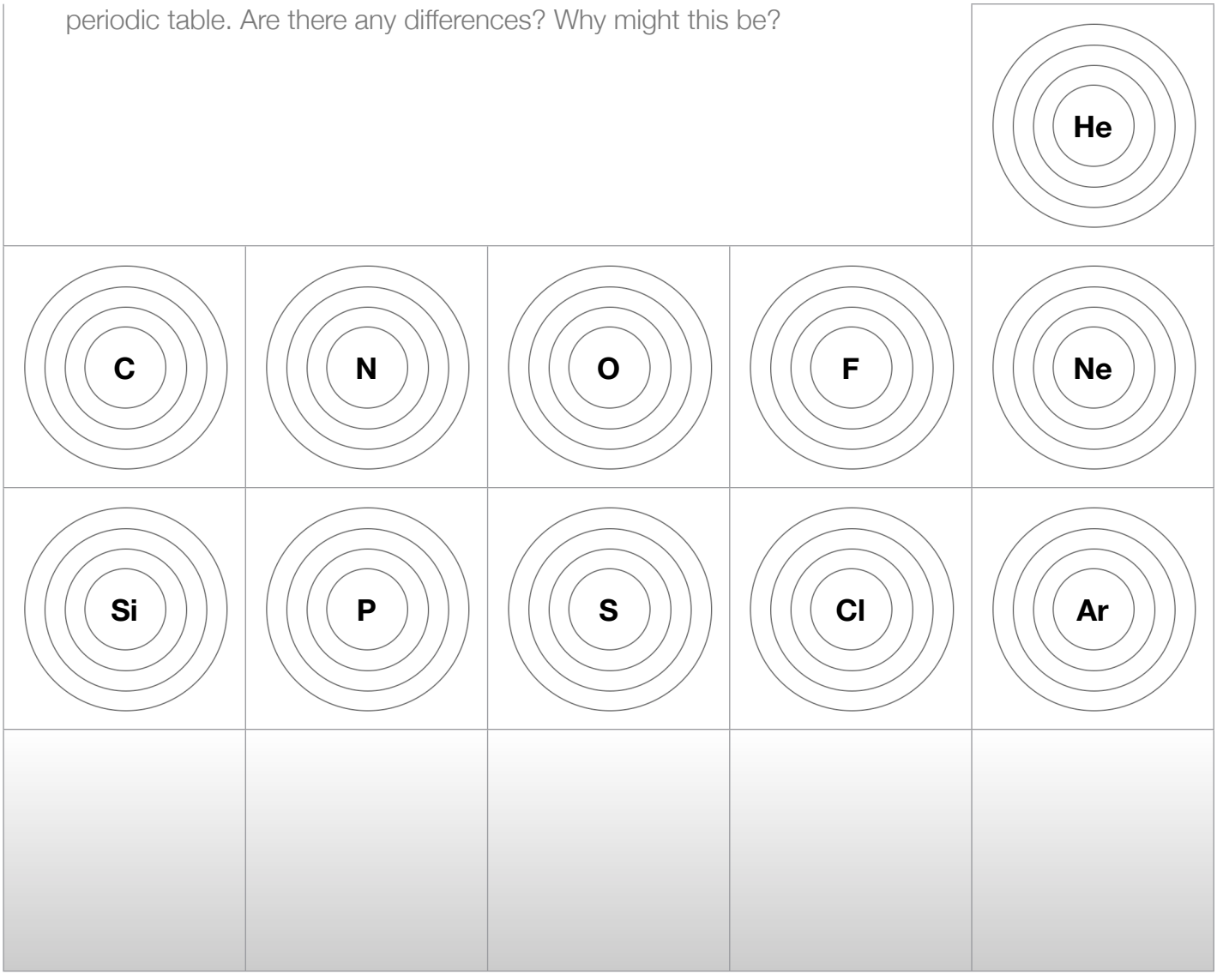


If the outer shell is more than half full it will gain electrons to make it full. Colour these gained electrons **green**.

When an atom loses electrons, it has a **positive charge** equal to the number of lose electrons. When it gains electrons, it has a **negative charge** equal to the number of gained electrons. Write these charges beside the Bohr-Rutherford diagram.

Notice the pattern the charges make.

Compare the charges you determined to the charges actual charges on a periodic table. Are there any differences? Why might this be?



Chemistry

forming simple ionic compounds

Reactants		Product	
Metal	**Nonmetal**	**Name**	**Formula**
silver	fluorine		
sodium	phosphorus		
silver	sulfur		
beryllium	phosphorus		
calcium	chlorine		
lithium	fluorine		
calcium	iodine		
magnesium	phosphorus		
aluminum	oxygen		
potassium	nitrogen		
lithium	sulfur		
aluminum	fluorine		
aluminum	chlorine		
aluminum	phosphorus		
magnesium	sulfur		
silver	iodine		
potassium	sulfur		
magnesium	iodine		
calcium	oxygen		
calcium	phosphorus		
aluminum	nitrogen		
calcium	nitrogen		
calcium	iodine		

Reactants		Product	
Metal	**Nonmetal**	**Name**	**Formula**
potassium	chlorine		
sodium	nitrogen		
aluminum	bromine		
silver	iodine		
sodium	oxygen		
beryllium	sulfur		
potassium	bromine		
calcium	fluorine		
calcium	oxygen		
silver	bromine		
calcium	chlorine		
potassium	chlorine		
lithium	fluorine		
magnesium	sulfur		
potassium	nitrogen		
potassium	phosphorus		
sodium	fluorine		
aluminum	bromine		
magnesium	bromine		
beryllium	fluorine		
calcium	oxygen		
aluminum	phosphorus		
calcium	nitrogen		

Answers

silver fluoride — AgF
sodium phosphide — Na_3P
silver sulfide — Ag_2S
beryllium phosphide — Be_3P_2
calcium chloride — $CaCl_2$
lithium fluoride — LiF
calcium iodide — CaI_2
magnesium phosphide — Mg_3P_2
aluminum oxide — Al_2O_3
potassium nitride — K_3N
lithium sulfide — Li_2S
aluminum fluoride — AlF_3
aluminum chloride — $AlCl_3$
aluminum phosphide — AlP
magnesium sulfide — MgS
silver iodide — AgI
potassium sulfide — K_2S
magnesium iodide — MgI_2
calcium oxide — CaO
calcium phosphide — Ca_3P_2
aluminum nitride — AlN
calcium nitride — Ca_3N_2
calcium iodide — CaI_2
potassium chloride — KCl
sodium nitride — Na_3N
aluminum bromide — $AlBr_3$
silver iodide — AgI
sodium oxide — Na_2O
beryllium sulfide — BeS
potassium bromide — KBr
calcium fluoride — CaF_2
calcium oxide — CaO
silver bromide — $AgBr$
calcium chloride — $CaCl_2$
potassium chloride — KCl
lithium fluoride — LiF
magnesium sulfide — MgS
potassium nitride — K_3N
potassium phosphide — K_3P
sodium fluoride — NaF
aluminum bromide — $AlBr_3$
magnesium bromide — $MgBr_2$
beryllium fluoride — BeF_2
calcium oxide — CaO
aluminum phosphide — AlP
calcium nitride — Ca_3N_2

Chemistry

forming ionic compounds with multivalent metals

Reactants		Product	
Metal	**Nonmetal**	**Name**	**Formula**
copper (II)	nitrogen		
iron (II)	phosphorus		
copper (I)	oxygen		
lead (IV)	bromine		
beryllium	chlorine		
tin (II)	fluorine		
beryllium	iodine		
iron (II)	iodine		
beryllium	sulfur		
gold (I)	iodine		
tin (II)	iodine		
tin (II)	chlorine		
aluminum	bromine		
magnesium	chlorine		
aluminum	nitrogen		
copper (I)	phosphorus		
copper (I)	fluorine		
iron (III)	iodine		
calcium	phosphorus		
beryllium	chlorine		
lead (II)	phosphorus		
nickel (III)	iodine		
sodium	phosphorus		

Reactants		Product	
Metal	**Nonmetal**	**Name**	**Formula**
aluminum	chlorine		
nickel (III)	iodine		
potassium	chlorine		
sodium	iodine		
lead (IV)	phosphorus		
beryllium	phosphorus		
sodium	iodine		
nickel (II)	oxygen		
beryllium	chlorine		
tin (IV)	sulfur		
silver	phosphorus		
copper (I)	oxygen		
tin (IV)	bromine		
copper (II)	phosphorus		
lead (IV)	nitrogen		
gold (I)	chlorine		
gold (III)	bromine		
aluminum	oxygen		
copper (II)	fluorine		
nickel (III)	chlorine		
potassium	oxygen		
calcium	nitrogen		
beryllium	sulfur		

Answers

copper (II) nitride — Cu_3N_2
iron (II) phosphide — Fe_3P_2
copper (I) oxide — Cu_2O
lead (IV) bromide — $PbBr_4$
beryllium chloride — $BeCl_2$
tin (II) fluoride — SnF_2
beryllium iodide — BeI_2
iron (II) iodide — $FeI2$
beryllium sulfide — BeS
gold (I) iodide — AuI
tin (II) iodide — SnI_2
tin (II) chloride — $SnCl_2$
aluminum bromide — $AlBr_3$
magnesium chloride — $MgCl_2$
aluminum nitride — AlN
copper (I) phosphide — Cu_3P
copper (I) fluoride — CuF
iron (III) iodide — FeI_3
calcium phosphide — Ca_3P_2
beryllium chloride — $BeCl_2$
lead (II) phosphide — Pb_3P_2
nickel (III) iodide — NiI_3
sodium phosphide — Na_3P
nickel (III) iodide — NiI_3
aluminum chloride — $AlCl_3$
nickel (III) iodide — NiI_3
potassium chloride — KCl
sodium iodide — NaI
lead (IV) phosphide — Pb_3P_4
beryllium phosphide — Be_3P_2
sodium iodide — NaI
nickel (II) oxide — NiO
beryllium chloride — $BeCl_2$
tin (IV) sulfide — SnS_2
silver phosphide — Ag_3P
copper (I) oxide — Cu_2O
tin (IV) bromide — $SnBr_4$
copper (II) phosphide — Cu_3P_2
lead (IV) nitride — Pb_3N_4
gold (I) chloride — $AuCl$
gold (III) bromide — $AuBr_3$
aluminum oxide — Al_2O_3
nickel (III) chloride — $NiCl_3$
copper (II) fluoride — CuF_2
potassium oxide — K_2O
calcium nitride — Ca_3N_2
beryllium sulfide — BeS

Chemistry

forming ionic compounds with polyatomic ions

Reactants		Product	
Metal	**Nonmetal**	**Name**	**Formula**
nickel (III)	sulfate		
iron (III)	sulfate		
calcium	phosphate		
lead (IV)	nitrogen		
magnesium	fluorine		
potassium	nitrite		
copper (II)	chlorate		
potassium	nitrogen		
lithium	oxygen		
aluminum	hydroxide		
tin (IV)	chlorine		
magnesium	fluorine		
gold (III)	nitrogen		
tin (IV)	nitrite		
nickel (III)	phosphate		
potassium	nitrate		
silver	phosphate		
potassium	iodine		
iron (II)	sulfur		
lead (II)	nitrite		
iron (III)	iodine		
sodium	nitrate		
iron (II)	hydroxide		

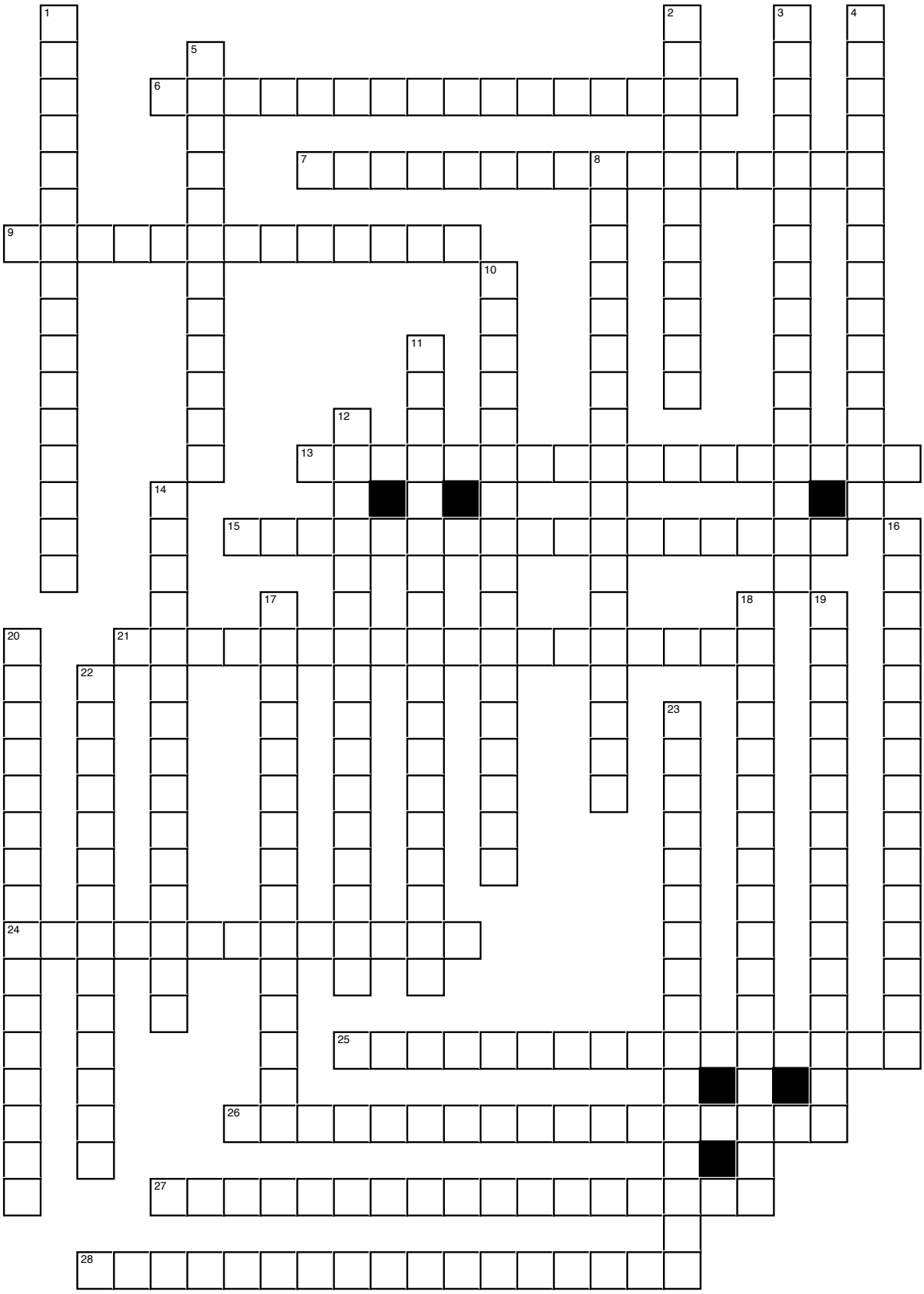
Reactants		Product	
Metal	**Nonmetal**	**Name**	**Formula**
tin (IV)	nitrite		
calcium	sulfate		
gold (I)	nitrate		
iron (II)	nitrate		
tin (IV)	carbonate		
silver	sulfur		
gold (I)	nitrogen		
tin (IV)	sulfate		
tin (II)	sulfate		
lead (IV)	oxygen		
iron (III)	nitrogen		
nickel (III)	nitrogen		
copper (II)	bicarbonate		
gold (I)	bicarbonate		
nickel (II)	bromine		
tin (II)	oxygen		
calcium	phosphate		
calcium	nitrate		
tin (IV)	iodine		
iron (II)	hydroxide		
magnesium	fluorine		
lithium	chlorine		
tin (IV)	nitrogen		

Answers

nickel (III) sulfate — $Ni_2(SO_4)_3$
iron (III) sulfate — $Fe_2(SO_4)_3$
calcium phosphate — $Ca_3(PO_4)_2$
lead (IV) nitride — Pb_3N_4
magnesium fluoride — MgF_2
potassium nitrite — KNO_2
copper (II) chlorate — $Cu(ClO_3)_2$
potassium nitride — K_3N
lithium oxide — Li_2O
aluminum hydroxide — $Al(OH)_3$
tin (IV) chloride — $SnCl_4$
magnesium fluoride — MgF_2
gold (III) nitride — AuN
tin (IV) nitrite — $Sn(NO_2)_4$
nickel (III) phosphate — $NiPO_4$
potassium nitrate — KNO_3
silver phosphate — Ag_3PO_4
potassium iodide — KI
iron (II) sulfide — FeS
lead (II) nitrite — $Pb(NO_2)_2$
iron (III) iodide — FeI_3
sodium nitrate — $NaNO_3$
iron (II) hydroxide — $Fe(OH)_2$
tin (IV) nitrite — $Sn(NO_2)_4$
calcium sulfate — $CaSO_4$
gold (I) nitrate — $AuNO_3$
iron (II) nitrate — $Fe(NO_3)_2$
tin (IV) carbonate — $Sn(CO_3)_2$
silver sulfide — Ag_2S
gold (I) nitride — Au_3N
tin (IV) sulfate — $Sn(SO_4)_2$
tin (II) sulfate — $SnSO_4$
lead (IV) oxide — PbO_2
iron (III) nitride — FeN
nickel (III) nitride — NiN
copper (II) bicarbonate — $Cu(HCO_3)_2$
gold (I) bicarbonate — $AuHCO_3$
nickel (II) bromide — $NiBr_2$
tin (II) oxide — SnO
calcium phosphate — $Ca_3(PO_4)_2$
calcium nitrate — $Ca(NO_3)_2$
tin (IV) iodide — SnI_4
iron (II) hydroxide — $Fe(OH)_2$
magnesium fluoride — MgF_2
lithium chloride — $LiCl$
tin (IV) nitride — Sn_3N_4

Chemistry

naming ionic compounds

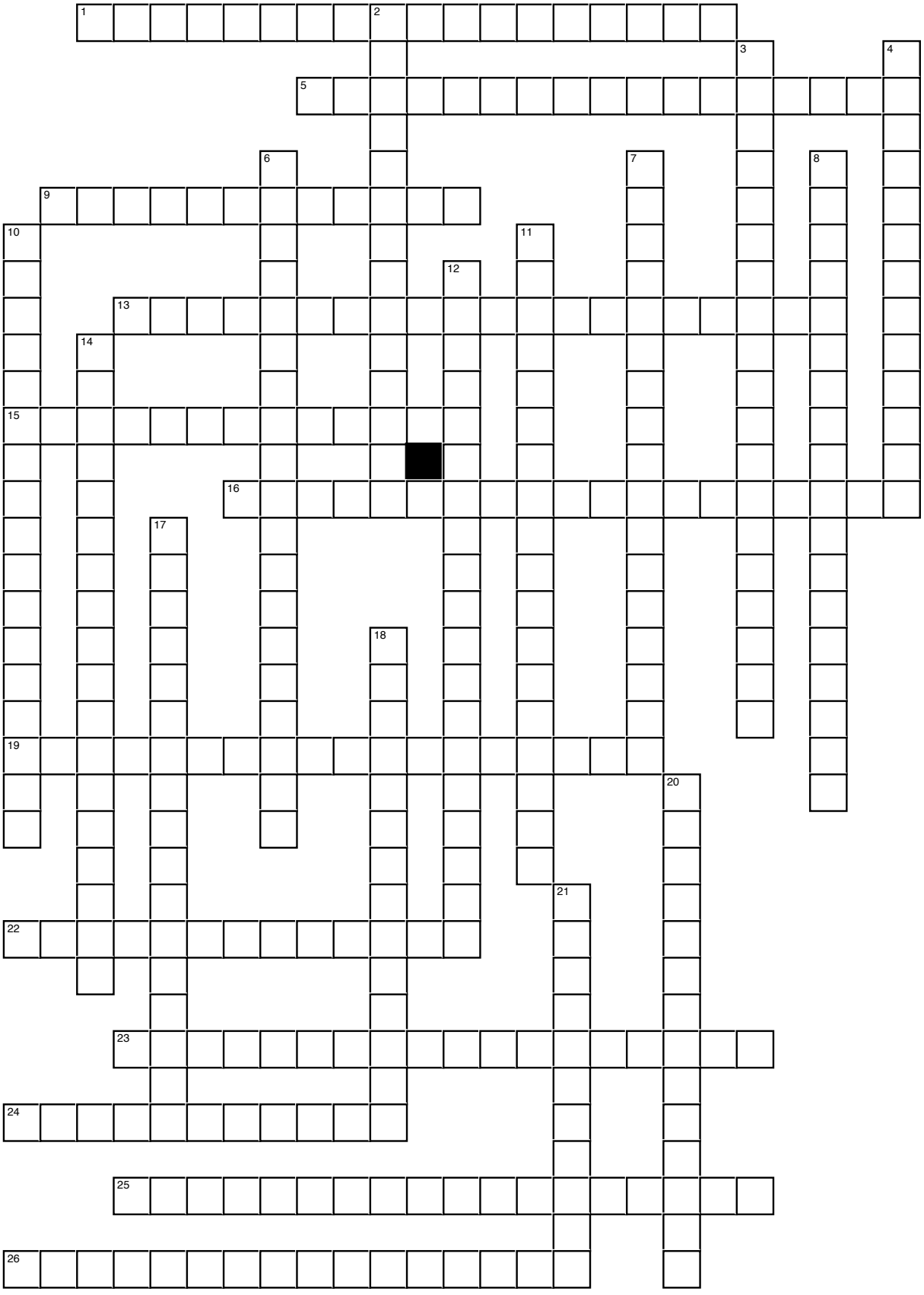


Across

6. Mg_3N_2
7. BeS
9. LiI
13. KF
15. KCl
21. Be_3P_2
24. CaI_2
25. $MgBr_2$
26. $BeCl_2$
27. AlP
28. MgF_2

Down

1. MgS
2. Na_2O
3. AlF_3
4. AgF
5. CaO
8. Mg_3P_2
10. $MgCl_2$
11. K_3P
12. K_3N
14. MgI_2
16. KI
17. AlN
18. BeF_2
19. LiCl
20. $AlCl_3$
22. NaF
23. $BeBr_2$



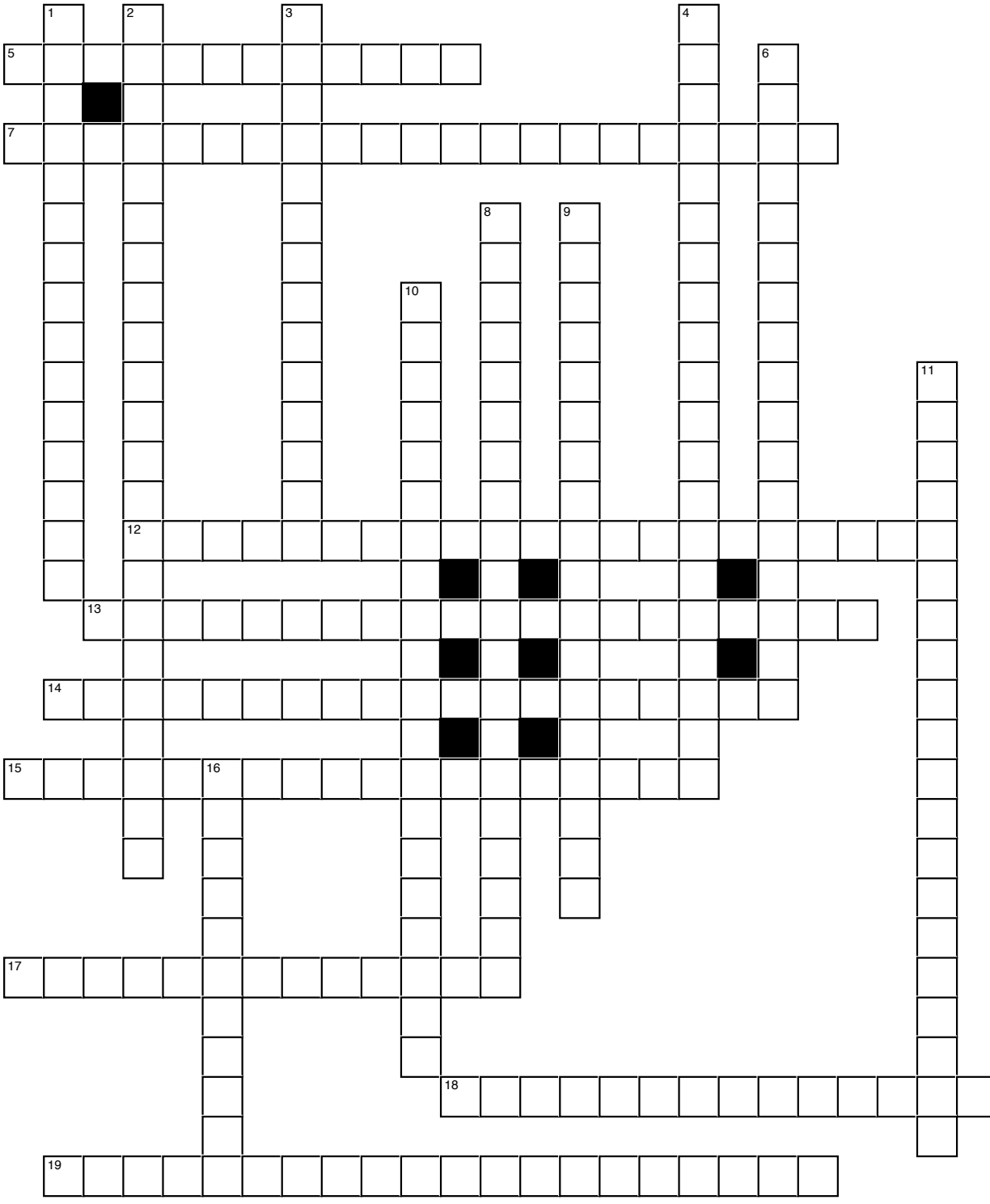
Across

1. $NiCl_2$
5. FeF_3
9. AgI
13. NiP
15. Ag_3N
16. $NiCl_3$
19. FeP
22. NaBr
23. NiF_2
24. Ag_2O
25. NiN
26. Cu_3N

Down

2. FeI_2
3. Cu_3P_2
4. PbO
6. NiF_3
7. KCl
8. Ni_2S_3
10. MgF_2
11. Cu_3P
12. Ni_3P_2
14. AuP
17. NiS
18. Li_3N
20. Cu_2O
21. Na_2O

Chemistry

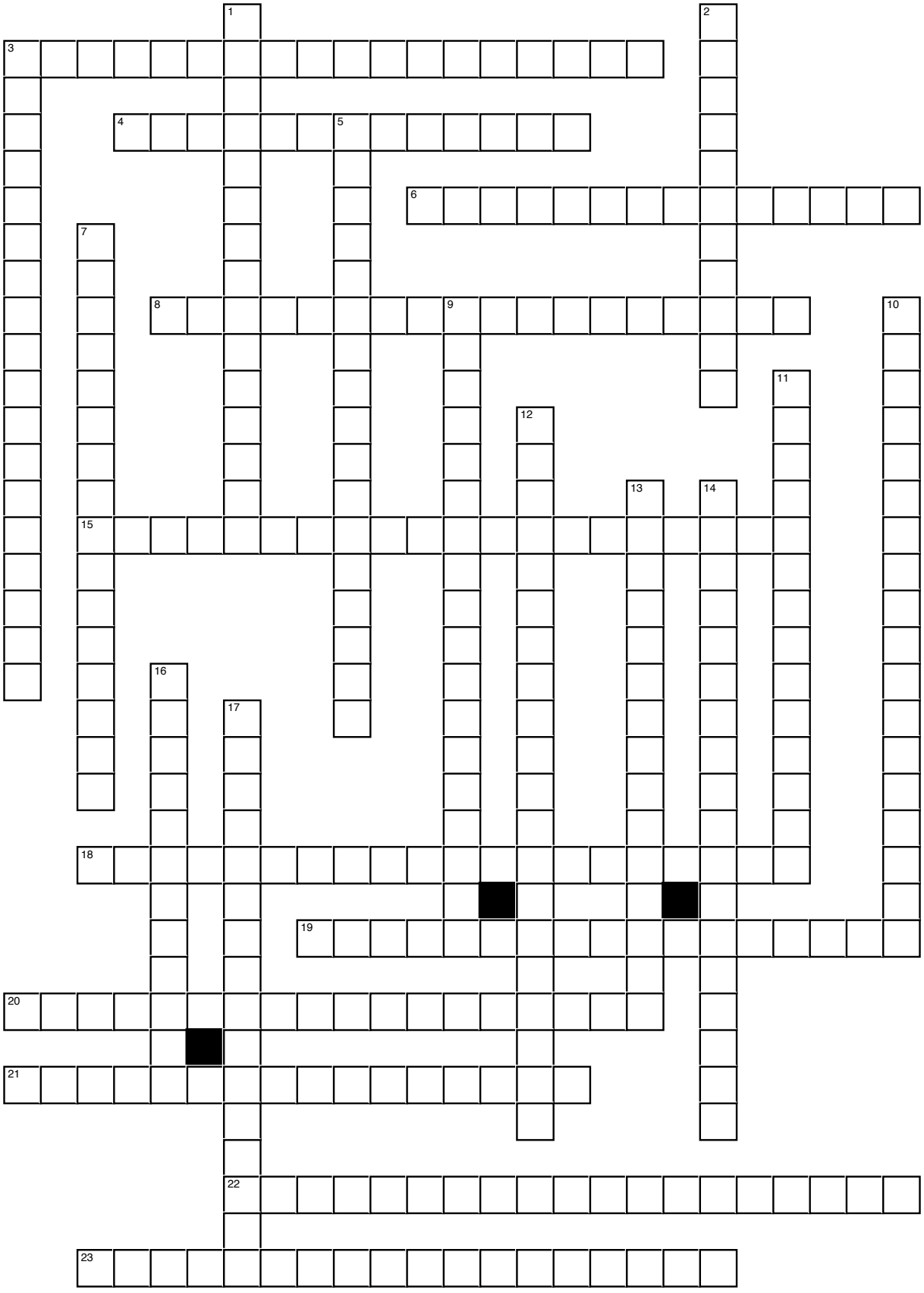


Across

5. NaI
7. $Ni(HCO_3)_2$
12. $Cu(HCO_3)_2$
13. $Fe(HCO_3)_3$
14. $Fe(HCO_3)_2$
15. K_2CO_3
17. $AgNO_3$
18. $Sn(NO_3)_4$
19. NiP

Down

1. NaOH
2. $Ni(HCO_3)_3$
3. NaF
4. $Mg(HCO_3)_2$
6. $KClO_3$
8. $CuHCO_3$
9. $LiHCO_3$
10. $Au(HCO_3)_3$
11. $Ni_2(CO_3)_3$
16. Ag_2O



Across

3. K_3P
4. AgBr
6. BeO
8. Be_3P_2
15. $Mg(HCO_3)_2$
18. $Be(HCO_3)_2$
19. $AgHCO_3$
20. $LiHCO_3$
21. $Mg(NO_2)_2$
22. $Al(HCO_3)_3$
23. $Mg(OH)_2$

Down

1. Ag_2CO_3
2. Na_2O
3. K_2CO_3
5. BeF_2
7. $BeBr_2$
9. Mg_3P_2
10. KOH
11. MgO
12. $KHCO_3$
13. Na_2CO_3
14. $Ca(HCO_3)_2$
16. AgI
17. $Be(NO_3)_2$

Chemistry

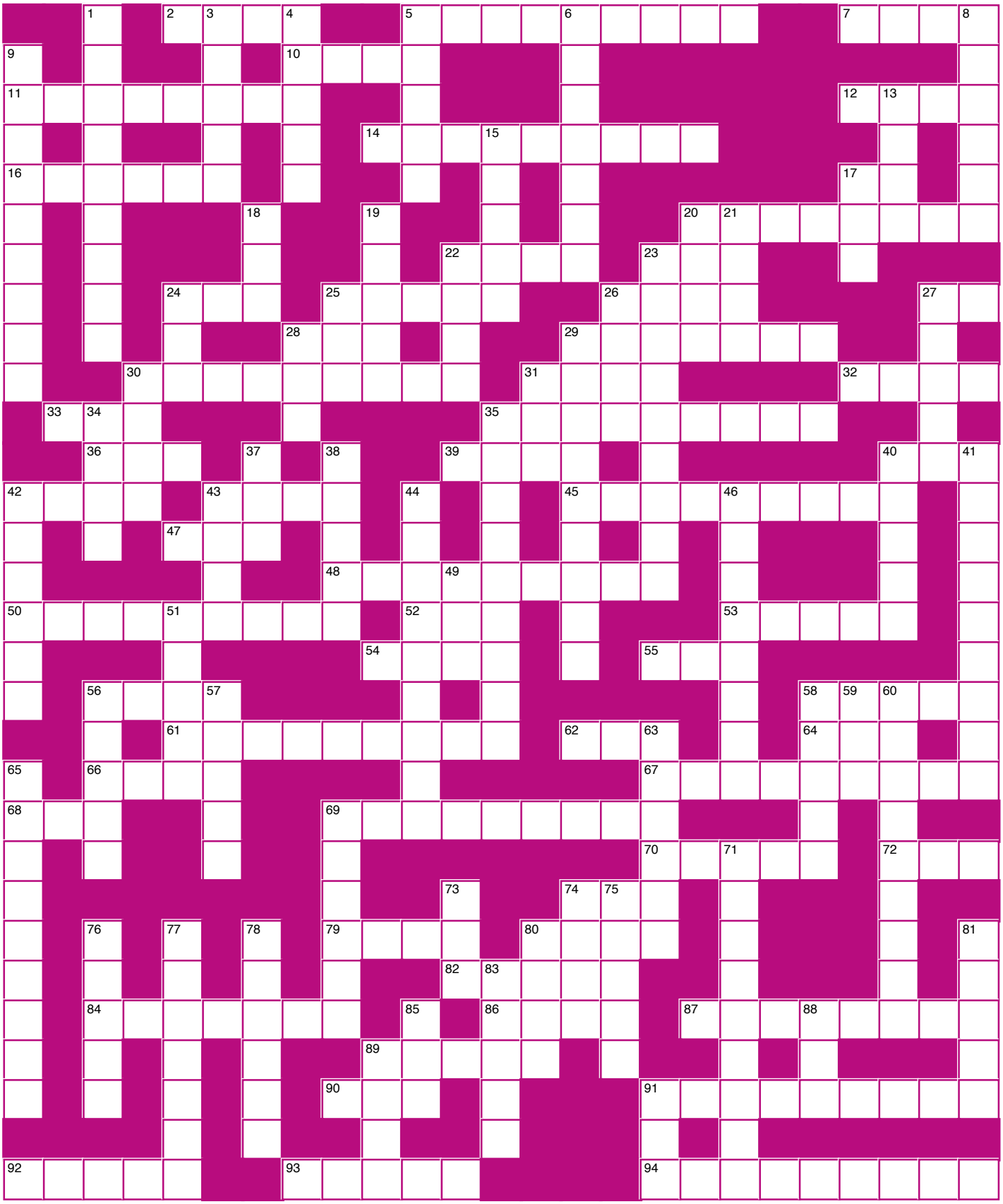
writing ionic formulas

Across

2. sodium sulfide
5. aluminum sulfate
7. silver nitride
10. sodium chloride
11. nickel (III) nitrite
12. calcium fluoride
14. aluminum chlorate
16. copper (I) chlorate
17. potassium iodide
20. aluminum nitrate
22. potassium nitrite
23. silver iodide
24. aluminum phosphide
25. lead (II) nitride
26. gold (I) oxide
27. potassium fluoride
28. potassium bromide
29. copper (II) hydroxide
30. nickel (III) bicarbonate
31. copper (I) hydroxide
32. copper (I) chloride
33. sodium iodide
35. calcium bicarbonate
36. lithium iodide
39. sodium hydroxide
40. potassium nitride
42. nickel (III) fluoride
43. copper (I) nitride
45. calcium phosphate
47. gold (I) fluoride
48. nickel (III) chlorate
50. tin (II) bicarbonate
52. copper (II) oxide
53. nickel (III) phosphate
54. aluminum iodide
55. iron (II) oxide
56. sodium nitride
58. tin (II) sulfate
61. nickel (II) chlorate
62. iron (III) nitride
64. nickel (III) nitride
66. copper (I) sulfide
67. gold (III) carbonate
68. beryllium oxide
69. aluminum carbonate
70. lead (II) carbonate
72. lead (II) sulfide
74. tin (II) oxide
79. lithium chloride
80. tin (IV) iodide
82. sodium nitrite
84. nickel (III) hydroxide
86. lithium oxide
87. aluminum nitrite
89. calcium phosphide
90. copper (II) sulfide
91. nickel (II) phosphate
92. copper (I) nitrite
93. potassium phosphate
94. iron (III) carbonate

Down

1. nickel (II) bicarbonate
3. aluminum oxide
4. tin (II) phosphide
5. aluminum chloride
6. tin (II) hydroxide
8. sodium carbonate
9. tin (IV) chlorate
13. gold (III) iodide
15. calcium nitride
17. potassium hydroxide
18. potassium phosphide
19. nickel (III) bromide
20. silver oxide
21. lithium hydroxide
22. potassium nitrate
23. gold (III) bicarbonate
24. gold (I) iodide
25. lead (II) oxide
26. gold (I) hydroxide
27. potassium carbonate
28. potassium chloride
29. copper (II) bicarbonate
30. nickel (III) iodide
31. calcium oxide
34. aluminum fluoride
35. calcium chlorate
37. copper (I) fluoride
38. tin (II) nitride
40. potassium sulfate
41. nickel (III) sulfate
42. sodium sulfate
43. copper (I) oxide
44. tin (II) chlorate
46. lead (II) nitrate
49. copper (I) iodide
51. copper (II) nitride
56. nickel (II) carbonate
57. nickel (II) sulfate
58. tin (II) carbonate
59. nickel (II) oxide
60. tin (II) phosphate
63. sodium phosphate
65. lead (II) chlorate
69. gold (I) chlorate
71. copper (II) chlorate
73. aluminum nitride
74. tin (IV) oxide
75. nickel (III) oxide
76. copper (I) nitrate
77. calcium hydroxide
78. copper (I) bicarbonate
80. tin (II) iodide
81. nickel (II) nitride
83. aluminum phosphate
85. calcium sulfide
88. nickel (III) phosphide
89. copper (I) phosphide
91. sodium fluoride



Chemistry

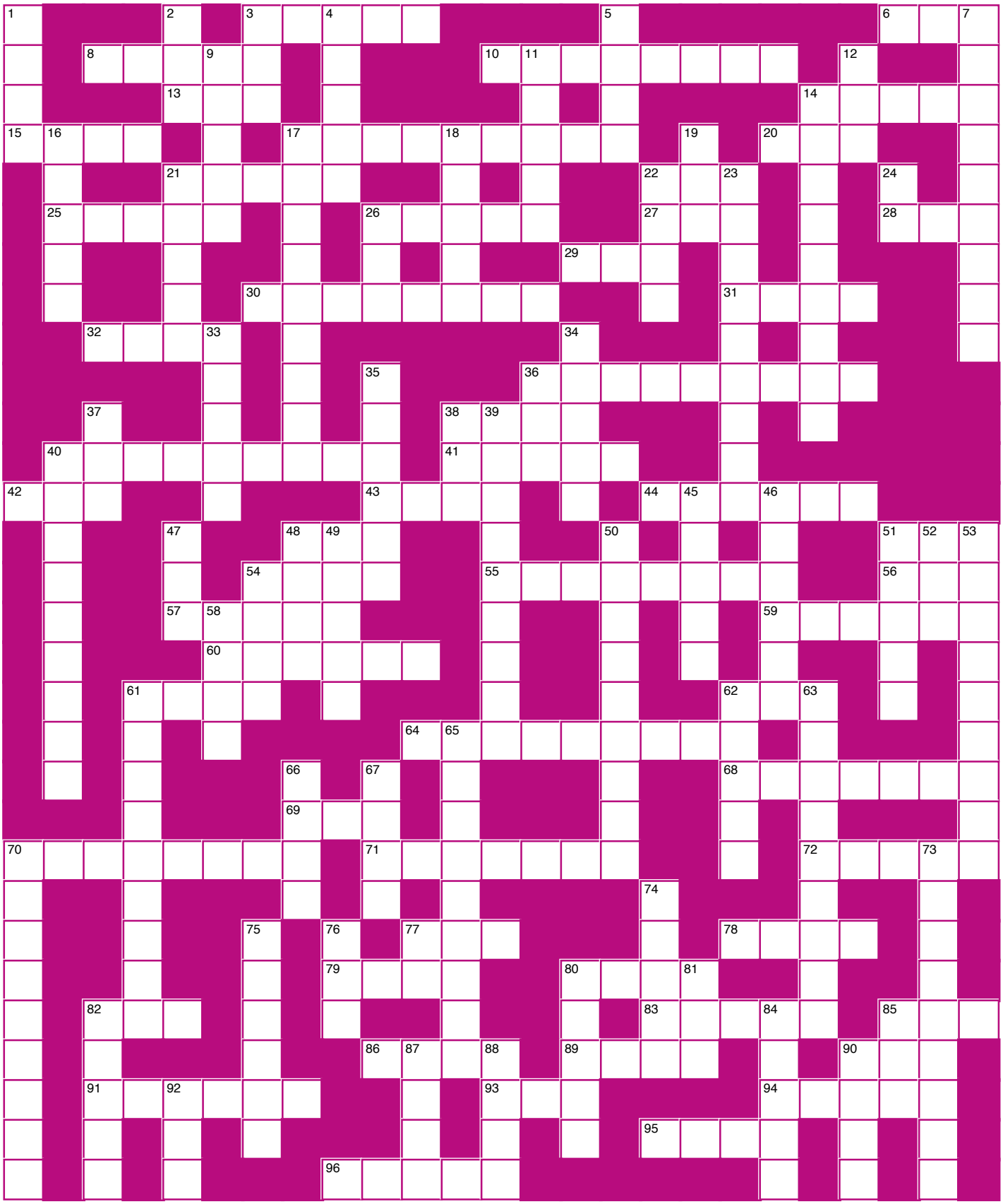
writing ionic formulas

Across

3. potassium carbonate
6. gold (I) fluoride
8. calcium phosphide
10. tin (IV) nitrate
13. lead (II) sulfide
14. copper (II) nitride
15. sodium chloride
17. aluminum bicarbonate
20. calcium oxide
21. tin (II) chloride
22. gold (III) nitride
25. nickel (II) nitride
26. gold (I) nitrite
27. lithium iodide
28. iron (II) oxide
29. silver iodide
30. aluminum nitrate
31. copper (I) hydroxide
32. sodium sulfide
36. nickel (III) chlorate
38. calcium iodide
40. copper (II) chlorate
41. aluminum phosphate
42. sodium fluoride
43. tin (IV) sulfide
44. sodium carbonate
48. tin (II) oxide
51. tin (II) sulfide
54. tin (IV) iodide
55. copper (II) nitrite
56. nickel (III) nitride
57. sodium nitrite
59. copper (I) bicarbonate
60. lithium sulfate
61. calcium fluoride
62. potassium nitride
64. calcium phosphate
68. tin (IV) hydroxide
69. gold (I) iodide
70. lead (IV) carbonate
71. calcium hydroxide
72. calcium nitride
77. potassium hydroxide
78. copper (I) phosphide
79. gold (III) iodide
80. sodium nitride
82. potassium oxide
83. nickel (III) chloride
85. potassium chloride
86. sodium phosphide
89. copper (I) sulfide
90. lead (II) oxide
91. lithium chlorate
93. beryllium oxide
94. nickel (III) bromide
95. gold (I) oxide
96. copper (I) nitrite

Down

1. lithium nitride
2. potassium phosphide
3. potassium sulfide
4. calcium chloride
5. potassium nitrate
7. iron (III) carbonate
9. lead (II) nitride
11. nickel (II) phosphide
12. copper (II) oxide
14. calcium chlorate
16. gold (I) nitrate
17. aluminum chlorate
18. copper (I) nitrate
19. copper (I) iodide
21. tin (II) phosphide
22. aluminum iodide
23. nickel (II) chlorate
24. potassium fluoride
26. aluminum nitride
33. tin (IV) chloride
34. nickel (III) oxide
35. sodium sulfate
36. nickel (III) phosphide
37. copper (I) fluoride
38. calcium sulfide
39. aluminum carbonate
40. calcium bicarbonate
45. aluminum oxide
46. copper (I) carbonate
47. iron (III) nitride
48. tin (IV) oxide
49. nickel (III) sulfide
50. tin (II) chlorate
51. tin (II) carbonate
52. nickel (II) oxide
53. tin (II) phosphate
54. tin (II) iodide
58. aluminum fluoride
61. copper (II) bicarbonate
62. potassium sulfate
63. nickel (III) bicarbonate
65. gold (III) carbonate
66. sodium oxide
67. lithium chloride
70. lead (II) chlorate
73. nickel (II) bicarbonate
74. tin (II) nitride
75. sodium phosphate
76. sodium iodide
77. potassium iodide
80. nickel (II) carbonate
81. nickel (II) sulfide
82. potassium chlorate
84. lithium nitrate
85. potassium bromide
87. silver nitride
88. lead (II) iodide
90. lead (IV) sulfide
92. copper (II) sulfide



Chemistry

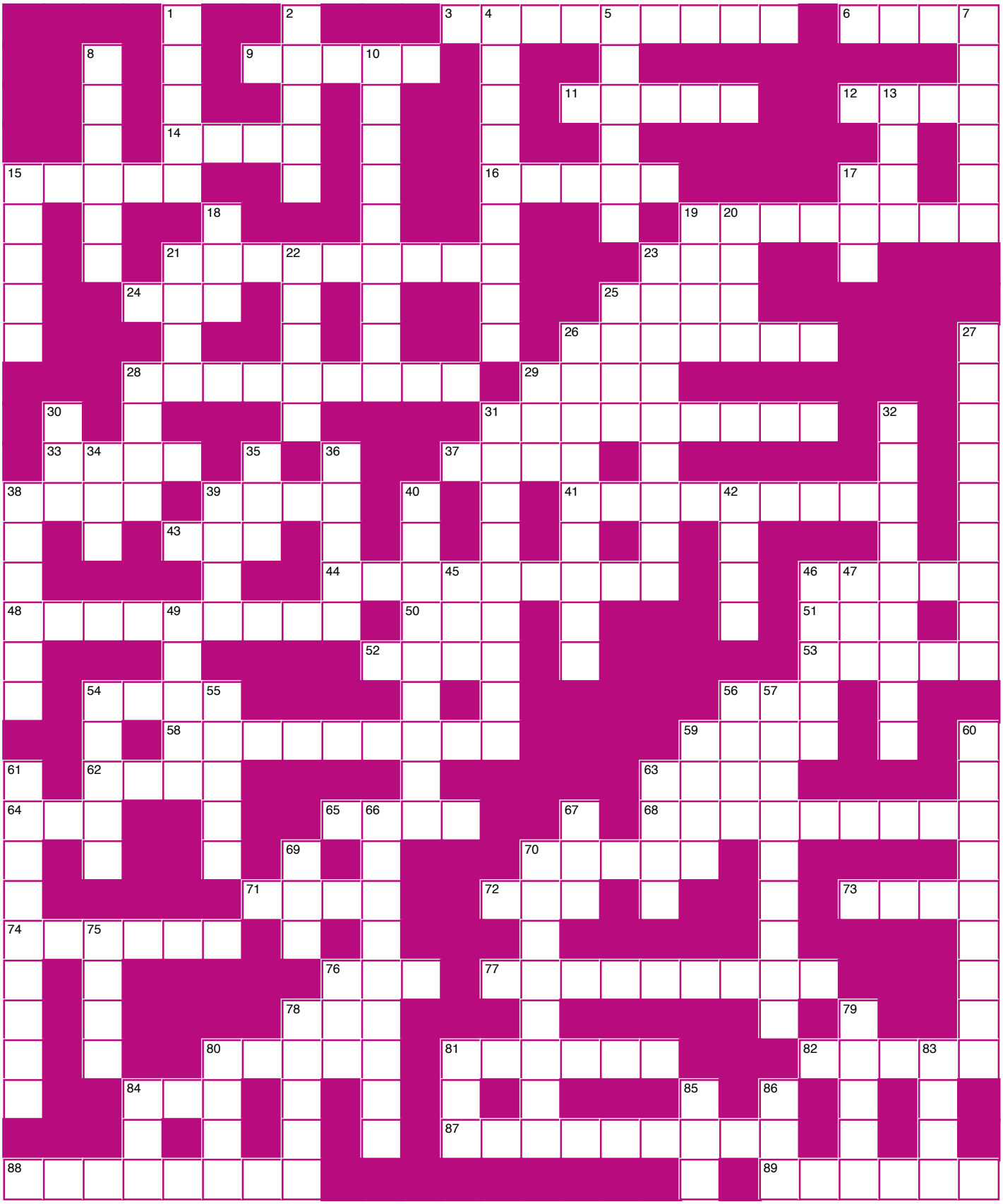
writing ionic formulas

Across

3. tin (IV) bicarbonate
6. silver nitride
9. calcium nitride
11. potassium bicarbonate
12. calcium fluoride
14. lithium oxide
15. potassium carbonate
16. copper (I) nitrate
17. potassium iodide
19. aluminum nitrate
21. aluminum chlorate
23. silver iodide
24. gold (III) phosphide
25. gold (I) oxide
26. copper (II) hydroxide
28. tin (IV) chlorate
29. copper (I) hydroxide
31. calcium bicarbonate
33. aluminum fluoride
37. sodium hydroxide
38. nickel (II) iodide
39. copper (I) nitride
41. calcium phosphate
43. gold (I) fluoride
44. nickel (III) chlorate
46. tin (II) carbonate
48. tin (II) bicarbonate
50. copper (II) oxide
51. nickel (II) oxide
52. aluminum iodide
53. tin (II) phosphide
54. sodium nitride
56. tin (II) oxide
58. nickel (II) chlorate
59. tin (IV) iodide
62. copper (I) sulfide
63. potassium nitrite
64. beryllium oxide
65. sodium sulfide
68. nickel (III) sulfate
70. copper (I) nitrite
71. tin (IV) sulfide
72. calcium sulfide
73. gold (I) phosphide
74. lithium chlorate
76. potassium chloride
77. tin (II) phosphate
78. lead (II) oxide
80. nickel (III) bromide
81. lithium carbonate
82. nickel (II) nitride
84. gold (I) iodide
87. iron (III) carbonate
88. nickel (III) nitrate
89. sodium phosphate

Down

1. nickel (III) chloride
2. calcium carbonate
4. nickel (II) bicarbonate
5. copper (I) bicarbonate
7. sodium carbonate
8. gold (I) bicarbonate
10. nickel (III) bicarbonate
13. gold (III) iodide
15. potassium chlorate
17. potassium hydroxide
18. aluminum phosphide
19. silver oxide
20. lithium hydroxide
21. gold (I) nitride
22. calcium chloride
23. gold (III) bicarbonate
25. gold (I) hydroxide
26. copper (II) bicarbonate
27. copper (II) chlorate
28. tin (II) fluoride
29. calcium oxide
30. sodium iodide
31. calcium chlorate
32. aluminum carbonate
34. lithium iodide
35. copper (I) fluoride
36. tin (II) nitride
38. sodium sulfate
39. copper (I) oxide
40. tin (II) chlorate
42. lead (IV) sulfide
45. copper (I) iodide
46. tin (II) sulfate
47. nickel (III) nitride
49. copper (II) nitride
54. nickel (II) carbonate
55. nickel (II) sulfate
56. tin (IV) oxide
57. nickel (III) carbonate
59. tin (II) iodide
60. nickel (II) phosphate
61. lead (II) chlorate
63. potassium nitrate
66. gold (III) carbonate
67. copper (II) sulfide
69. tin (II) sulfide
70. calcium nitrite
75. copper (I) phosphide
76. potassium bromide
78. lead (II) carbonate
79. lithium nitrate
80. nickel (III) fluoride
81. lithium fluoride
83. sodium oxide
84. aluminum nitride
85. potassium phosphide
86. potassium nitride



Chemistry

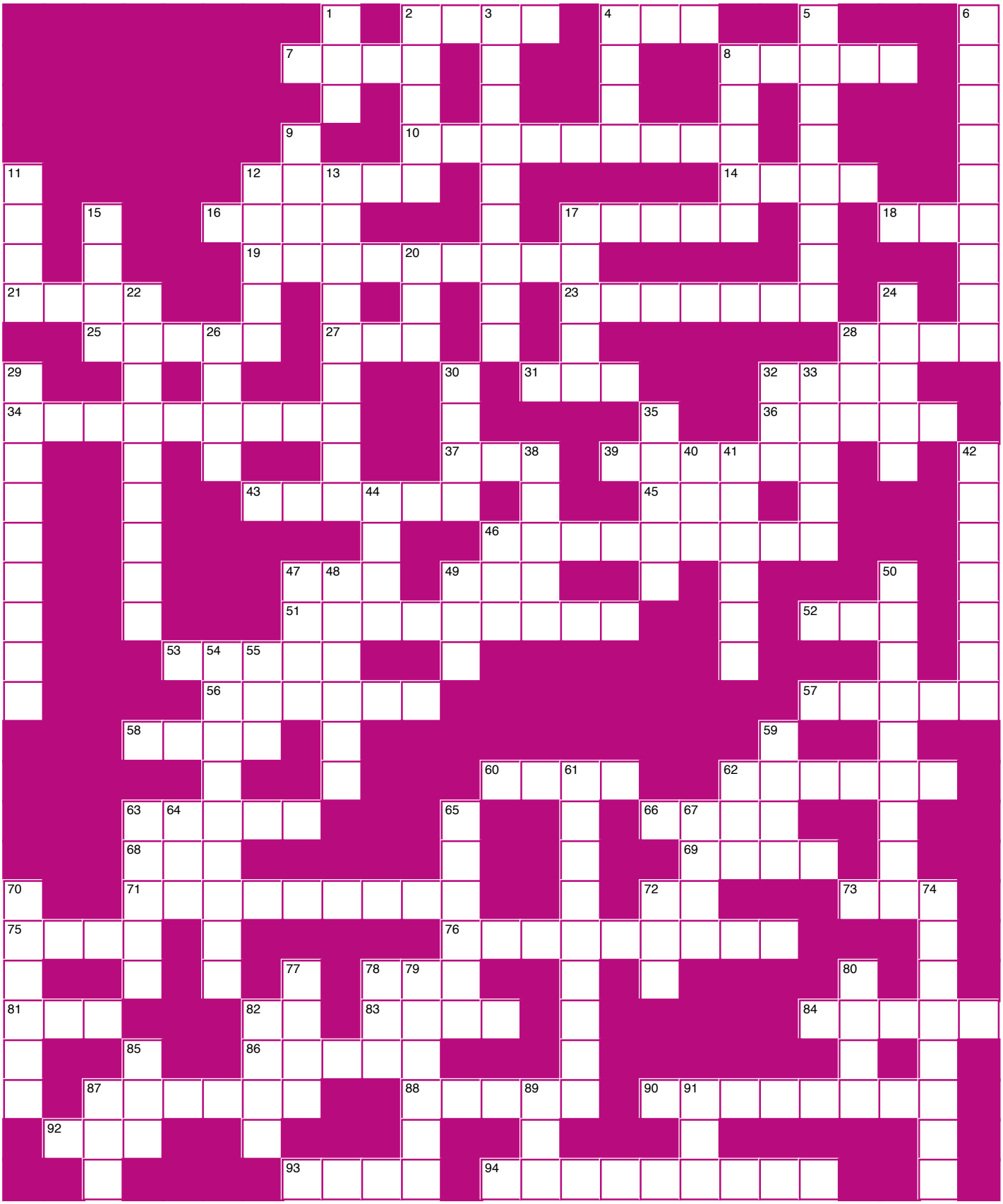
writing ionic formulas

Across

2. tin (II) fluoride
4. copper (II) sulfide
7. silver nitride
8. aluminum bromide
10. nickel (II) chlorate
12. calcium sulfate
14. tin (IV) oxide
16. copper (I) nitride
17. potassium chlorate
18. iron (II) oxide
19. tin (II) bicarbonate
21. sodium sulfide
23. calcium hydroxide
25. tin (IV) phosphide
27. lithium fluoride
28. nickel (III) fluoride
31. potassium phosphide
32. tin (II) iodide
34. aluminum chlorate
36. nickel (III) phosphate
37. iron (III) nitride
39. lithium chlorate
43. copper (I) carbonate
45. copper (I) iodide
46. lead (II) chlorate
47. sodium fluoride
49. potassium bromide
51. gold (III) carbonate
52. gold (I) iodide
53. sodium nitrite
56. lithium bicarbonate
57. calcium carbonate
58. copper (I) sulfide
60. sodium chloride
62. lithium carbonate
63. tin (II) carbonate
66. calcium iodide
68. nickel (II) oxide
69. lithium hydroxide
71. tin (II) phosphate
72. potassium fluoride
73. potassium nitride
75. gold (I) oxide
76. calcium chlorate
78. calcium oxide
81. lead (II) sulfide
82. potassium iodide
83. gold (I) phosphide
84. copper (II) nitride
86. nickel (III) sulfide
87. gold (I) chlorate
88. lead (II) nitride
90. lead (II) nitrate
92. aluminum nitride
93. tin (IV) iodide
94. nickel (III) bicarbonate

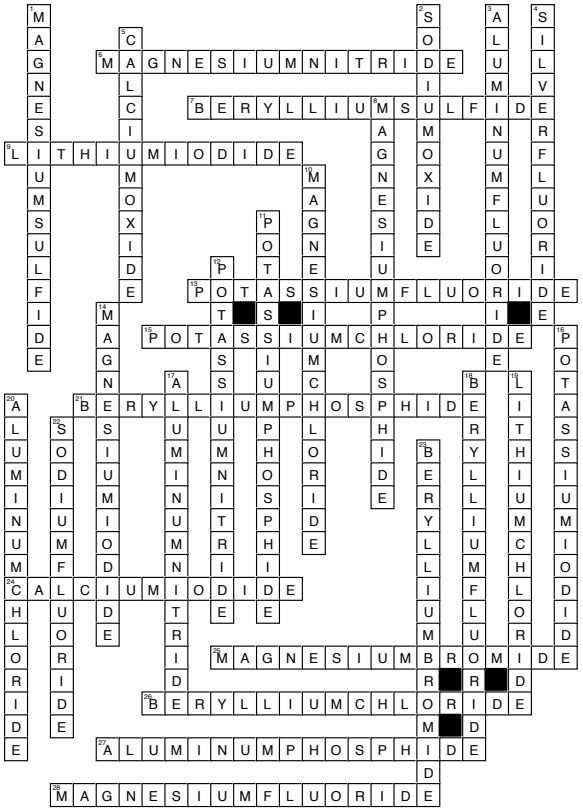
Down

1. magnesium oxide
2. tin (IV) nitride
3. iron (III) carbonate
4. copper (I) oxide
5. lead (IV) carbonate
6. gold (III) chlorate
8. aluminum sulfide
9. sodium nitride
11. lithium nitride
12. copper (II) sulfate
13. tin (II) chlorate
15. gold (I) sulfide
17. potassium carbonate
20. copper (I) fluoride
22. tin (IV) chlorate
24. nickel (III) oxide
26. lead (IV) oxide
28. nickel (III) phosphide
29. calcium phosphate
30. gold (III) fluoride
32. tin (II) oxide
33. nickel (II) nitride
35. nickel (III) chloride
38. nickel (III) bromide
40. copper (II) oxide
41. lithium phosphate
42. nickel (III) hydroxide
44. calcium fluoride
46. lead (II) oxide
47. sodium hydroxide
48. gold (I) carbonate
49. potassium chloride
50. nickel (III) chlorate
54. aluminum carbonate
55. nickel (II) sulfide
59. lithium oxide
61. calcium bicarbonate
62. lithium iodide
63. tin (II) sulfate
64. nickel (III) nitride
65. sodium carbonate
67. aluminum fluoride
70. sodium phosphate
72. potassium hydroxide
74. nickel (III) nitrite
77. nickel (III) iodide
78. calcium sulfide
79. gold (I) phosphate
80. gold (III) iodide
82. potassium nitrate
85. gold (III) nitride
87. aluminum phosphide
89. sodium iodide
91. beryllium oxide



Chemistry

crossword solutions



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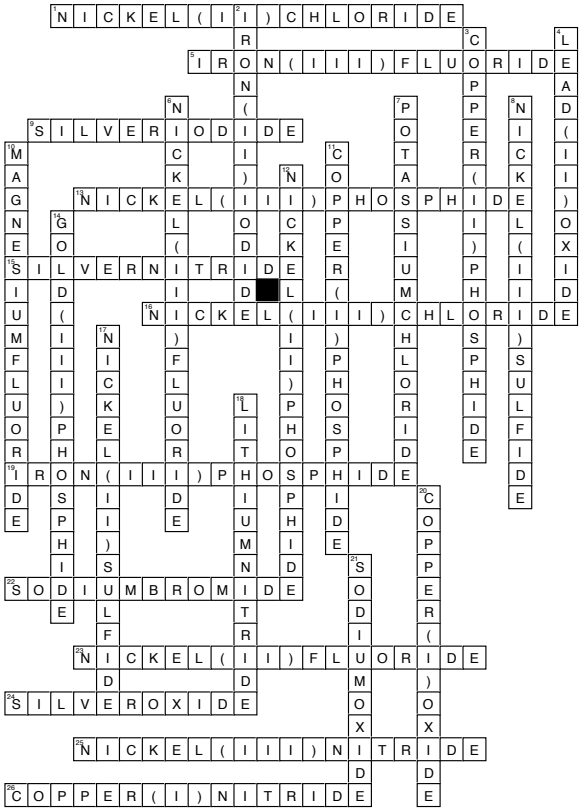

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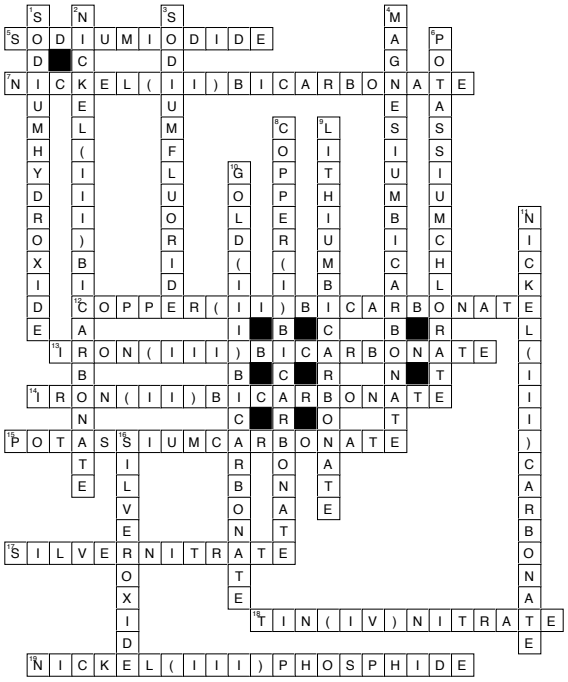

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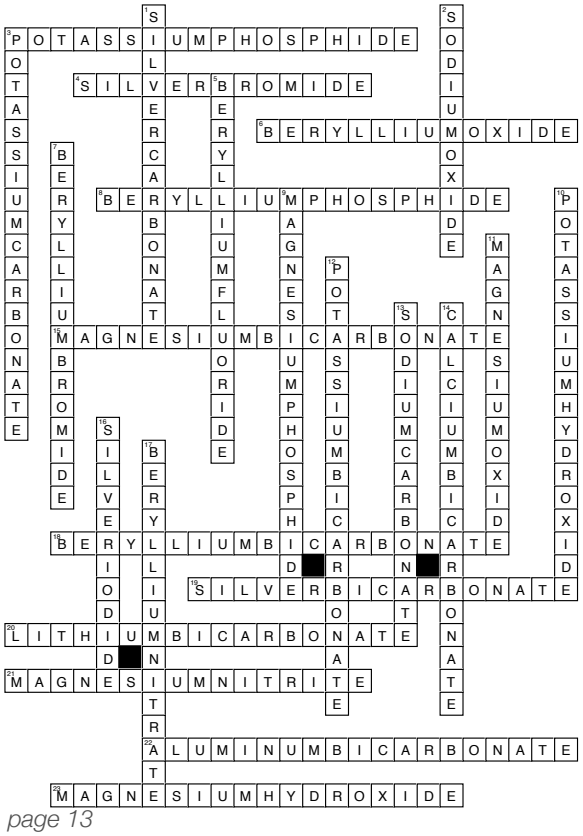

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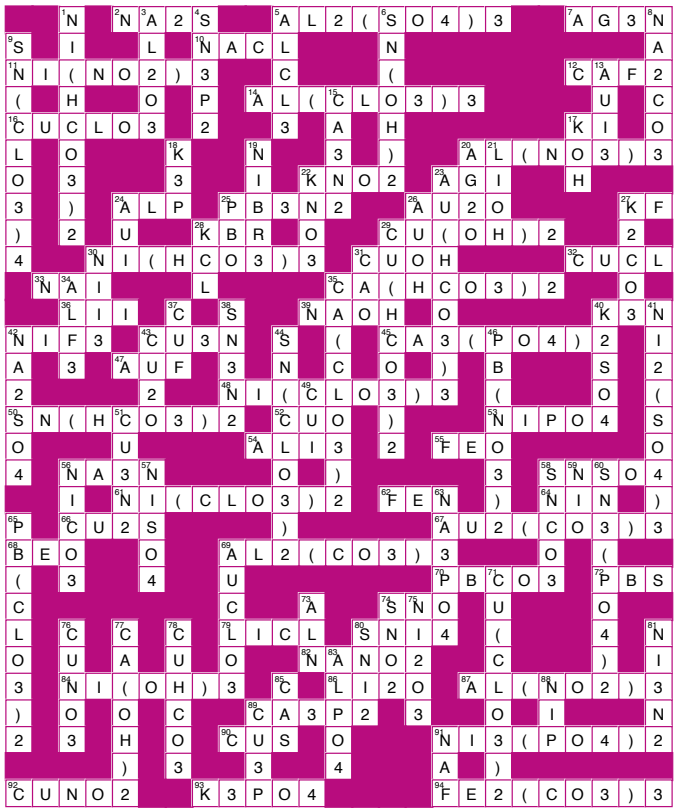

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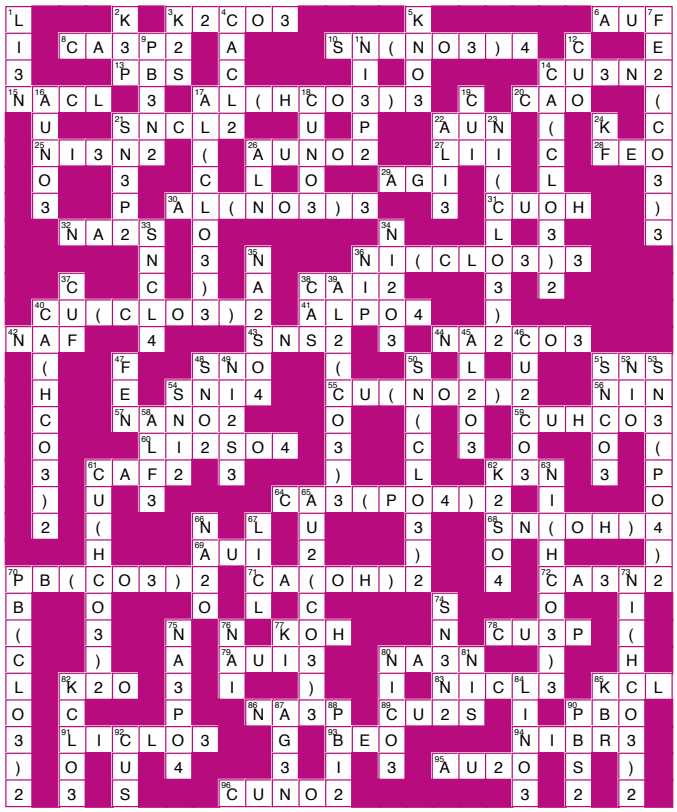

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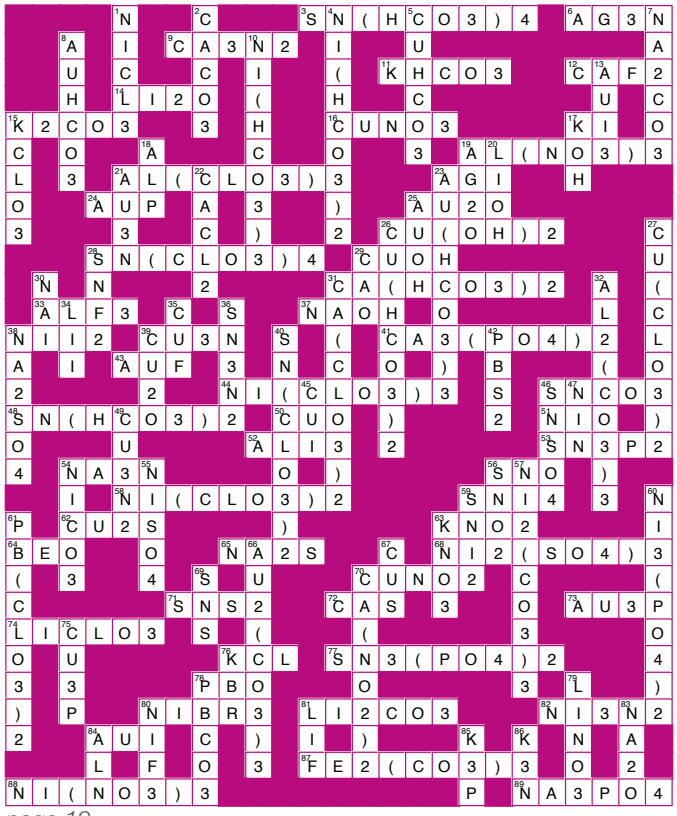

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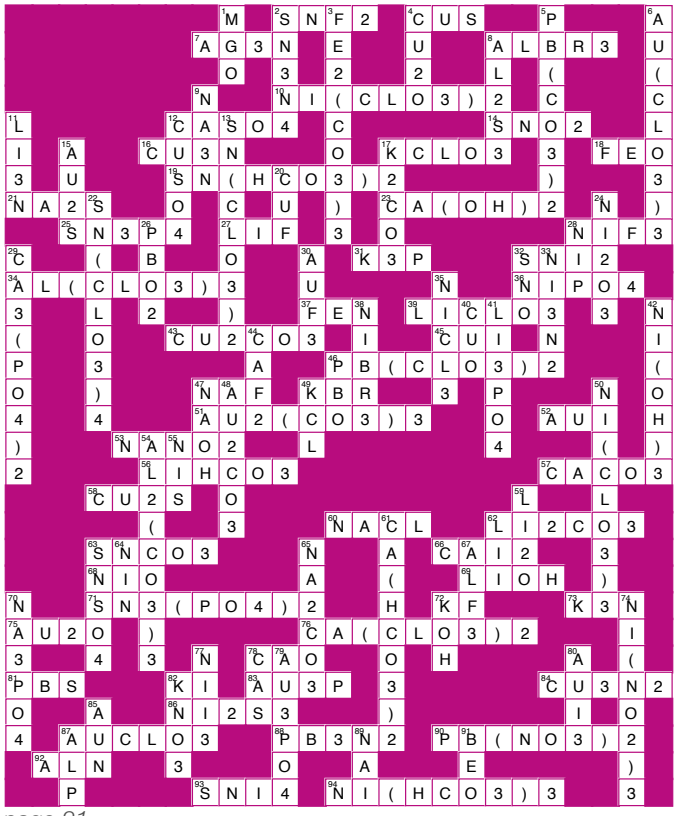

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Periodic Table and other useful information

1 **H** 1.01																	2 **He** 4.00
3 **Li** 6.94	4 **Be** 9.01											5 **B** 10.8	6 **C** 12.01	7 **N** 14.01	8 **O** 16.00	9 **F** 19.00	10 **Ne** 20.2
11 **Na** 22.99	12 **Mg** 24.31											13 **Al** 26.98	14 **Si** 28.09	15 **P** 30.97	16 **S** 32.07	17 **Cl** 35.45	18 **Ar** 39.9
19 **K** 39.10	20 **Ca** 40.08	21 **Sc** 45.0	22 **Ti** 47.9	23 **V** 50.9	24 **Cr** 52.0	25 **Mn** 54.9	26 **Fe** 55.8	27 **Co** 58.9	28 **Ni** 58.69	29 **Cu** 63.55	30 **Zn** 65.41	31 **Ga** 69.7	32 **Ge** 72.6	33 **As** 74.9	34 **Se** 79.0	35 **Br** 79.90	36 **Kr** 83.8
37 **Rb** 85.5	38 **Sr** 87.6	39 **Y** 88.9	40 **Zr** 91.2	41 **Nb** 92.9	42 **Mo** 95.9	43 **Tc** (99)	44 **Ru** 101.1	45 **Rh** 102.9	46 **Pd** 106.4	47 **Ag** 107.9	48 **Cd** 112.4	49 **In** 114.8	50 **Sn** 118.7	51 **Sb** 121.8	52 **Te** 127.6	53 **I** 126.9	54 **Xe** 131.3
55 **Cs** 132.9	56 **Ba** 137.3	57-71 see below	72 **Hf** 178.5	73 **Ta** 180.9	74 **W** 183.9	75 **Re** 186.2	76 **Os** 190.2	77 **Ir** 192.2	78 **Pt** 195.1	79 **Au** 197.0	80 **Hg** 200.6	81 **Tl** 204.4	82 **Pb** 207.2	83 **Bi** 209.0	84 **Po** (209)	85 **At** (210)	86 **Rn** (222)
87 **Fr** (223)	88 **Ra** (226)	89-103 see below															

57 **La** 138.9	58 **Ce** 140.1	59 **Pr** 140.9	60 **Nd** 144.2	61 **Pm** (147)	62 **Sm** 150.4	63 **Eu** 152.0	64 **Gd** 157.3	65 **Tb** 158.9	66 **Dy** 162.5	67 **Ho** 164.9	68 **Er** 167.3	69 **Tm** 168.9	70 **Yb** 173.0	71 **Lu** 175.0
89 **Ac** (227)	90 **Th** 232.0	91 **Pa** (231)	92 **U** 238.0	93 **Np** (237)	94 **Pu** (242)	95 **Am** (243)	96 **Cm** (247)	97 **Bk** (247)	98 **Cf** (251)	99 **Es** (252)	100 **Fm** (257)	101 **Md** (258)	102 **No** (259)	103 **Lr** (260)

Polyatomic Ions		
bicarbonate	HCO_3^-	–1
carbonate	CO_3^{2-}	–2
chlorate	ClO_3^-	–1
hydroxide	OH^-	–1
nitrate	NO_3^-	–1
nitrite	NO_2^-	–1
phosphate	PO_4^{3-}	–3
sulfate	SO_4^{2-}	–2
sulfite	SO_3^{2-}	–2
ammonium	NH_4^+	+1
acetate	CH_3COOO^-	–1
permanganate	MnO_4^-	–1
thiocyanate	SCN^-	–1
chromate	CrO_4^{2-}	–2
thiosulfate	$S_2O_3^{2-}$	–2

Multivalent Metals		
Symbol	Most common charge	Other charge
Cu	2+	1+
Hg	2+	1+
Au	3+	1+
Fe	3+	2+
Co	2+	3+
Ni	2+	3+
Pb	2+	4+
Sn	4+	2+

Other Metals	
Ag	1+
Al	3+
Zn	2+

Guidelines

1. Always list the **cation** (positive ion) first, followed by the **anion** (negative ion).
2. If the cation can have more than one charge, put its charge in Roman numerals after its name.
3. For the anion, change name of an **element** so it ends in “ide”. Names of **polyatomic ions** don’t change.
4. When writing formulas, don’t write a subscript if there is only one ion.
5. When writing formulas, put the polyatomic ion in brackets if there is more than one polyatomic ion.