

1 In the periodic table, the elements are arranged in

_____.

- ☐ A alphabetical order
- ☐ B order of increasing atomic number
- ☐ C order of increasing metallic properties
- ☐ D order of increasing neutron content
- ☐ E reverse alphabetical order

2 Elements _____ exhibit similar physical and chemical properties.

- ☐ A with similar chemical symbols
- ☐ B with similar atomic masses
- ☐ C in the same period of the periodic table
- ☐ D on opposite sides of the periodic table
- ☐ E in the same group of the periodic table

3 The element _____ is the most similar to strontium in chemical and physical properties.

- ☐ A Li
- ☐ B At
- ☐ C Ru
- ☐ D Ca
- ☐ E Na

4 Which pair of elements would you expect to exhibit the greatest similarity in their physical and chemical properties?

- ☐ A H, Li
- ☐ B Cs, Ba
- ☐ C Ca, Si
- ☐ D Ga, Ge
- ☐ E C, O

5 Which pair of elements would you expect to exhibit the greatest similarity in their physical and chemical properties?

- ☐ A F, Br
- ☐ B C, N
- ☐ C Li, Ca
- ☐ D H, He
- ☐ E Si, As

6 Which one of the following is a nonmetal?

- ☐ A W
- ☐ B Sr
- ☐ C Os
- ☐ D Ir
- ☐ E S

**7 Of the following,
_____ contains the
greatest number of
electrons.**

- ☐ A P^{3+}
- ☐ B P
- ☐ C P^{2-}
- ☐ D P^{3-}
- ☐ E P^{2+}

8 Which one of the following is most likely to lose electrons when forming an ion?

- ☐ A F
- ☐ B N
- ☐ C Cu
- ☐ D S
- ☐ E O

9 Which pair of elements below should be the most similar in chemical properties?

- ☐ A C and O
- ☐ B B and As
- ☐ C Ar and Ne
- ☐ D K and Kr
- ☐ E Cs and He

10 An element in the upper right corner of the periodic table _____.

- ☐ A is either a metal or metalloid
- ☐ B is definitely a metal
- ☐ C is either a metalloid or a non-metal
- ☐ D is definitely a non-metal
- ☐ E is definitely a metalloid

11 An element that appears in the lower left corner of the periodic table is

_____.

- ☐ A either a metal or metalloid
- ☐ B definitely a metal
- ☐ C either a metalloid or a non-metal
- ☐ D definitely a non-metal
- ☐ E definitely a metalloid

12 Elements in the same group of the periodic table typically have _____.

- ☐ A similar mass numbers
- ☐ B similar physical properties only
- ☐ C similar chemical properties only
- ☐ D similar atomic masses
- ☐ E similar physical and chemical properties

**13 Potassium is a _____
and chlorine is a
_____.**

- ☐ A metal, nonmetal
- ☐ B metal, metal
- ☐ C metal, metalloid
- ☐ D metalloid, nonmetal
- ☐ E nonmetal, metal

**14 Lithium is a _____
and magnesium is a
_____.**

- ☐ A nonmetal, metal
- ☐ B nonmetal, nonmetal
- ☐ C metal, metal
- ☐ D metal, metalloid
- ☐ E metalloid, metalloid

15 _____ are found
**uncombined, as
monatomic species in
nature.**

- ☐ A Noble gases
- ☐ B Chalcogens
- ☐ C Alkali metals
- ☐ D Alkaline earth metals
- ☐ E Halogens

**16 metals tend to _____
electrons and cations tend
to _____ electrons.**

- ☐ A gain, gain
- ☐ B lose, lose
- ☐ C gain, gain
- ☐ D gain, gain
- ☐ E neither, they keep their electrons

17 Anions tend to have a _____ charge and cations tend to have a _____ charge.

- ☐ A positive, positive
- ☐ B negative, negative
- ☐ C positive, negative
- ☐ D negative, positive
- ☐ E neither, they are both neutral

18 Anions tend to be _____ and cations tend to be _____.

- ☐ A metals, metals
- ☐ B nonmetals, nonmetals
- ☐ C metals, nonmetals
- ☐ D nonmetals, metals
- ☐ E metalloids, metalloids

19 Which species below is the nitride ion?

- ☐ A Na^+
- ☐ B NO^{3-}
- ☐ C NO^{2-}
- ☐ D NH^{4+}
- ☐ E N^{3-}

20 When a metal and a nonmetal react, the _____ tends to lose electrons and the _____ tends to gain electrons.

- ☐ A metal, metal
- ☐ B nonmetal, nonmetal
- ☐ C metal, nonmetal
- ☐ D nonmetal, metal
- ☐ E None of the above, these elements share electrons.

21 _____ typically form
ions with a 2+ charge.

- ☐ A Alkaline earth metals
- ☐ B Halogens
- ☐ C Chalcogens
- ☐ D Alkali metals
- ☐ E Transition metals

22 Sodium forms an ion with a charge of _____.

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

23 Aluminum forms an ion with a charge of _____.

- ☐ A 2+
- ☐ B 1-
- ☐ C 3+
- ☐ D 2-
- ☐ E 0

24 Calcium forms an ion with a charge of _____.

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

25 Barium forms an ion with a charge of _____.

- ☐ A 1+
- ☐ B 2-
- ☐ C 3+
- ☐ D 3-
- ☐ E 2+

26 Bromine forms an ion with a charge of _____.

- ☐ A 2+
- ☐ B 3-
- ☐ C 1+
- ☐ D 3+
- ☐ E 1-

27 Fluorine forms an ion with a charge of _____.

- ☐ A 1-
- ☐ B 1+
- ☐ C 2+
- ☐ D 3+
- ☐ E 3-

28 Iodine forms an ion with a charge of _____.

- ☐ A 7-
- ☐ B 1+
- ☐ C 2-
- ☐ D 2+
- ☐ E 1-

29 Oxygen forms an ion with a charge of _____.

- ☐ A 2-
- ☐ B 2+
- ☐ C 3-
- ☐ D 3+
- ☐ E 6+

30 Sulfur forms an ion with a charge of _____.

- ☐ A 2+
- ☐ B 2-
- ☐ C 3+
- ☐ D 6-
- ☐ E 6+

31 How many electrons does the Al^{3+} ion possess?

- ☐ A 16
- ☐ B 10
- ☐ C 6
- ☐ D 0
- ☐ E 13

32 Predict the charge of the most stable ion of P?

- ☐ A 2+
- ☐ B 3-
- ☐ C 3+
- ☐ D 1-
- ☐ E 2-

33 Predict the charge of the most stable ion of S?

- ☐ A 3+
- ☐ B 1-
- ☐ C 6+
- ☐ D 2+
- ☐ E 2-

34 What group in the periodic table would the fictitious element x be found?

- ☐ A Alkaline earth metals
- ☐ B Halogens
- ☐ C Chalcogens
- ☐ D Alkali metals
- ☐ E Transition metals

35 Which of the following compounds would you expect to be ionic?

- ☐ A SF_6
- ☐ B H_2O
- ☐ C CO_2
- ☐ D NH_3
- ☐ E CaO

36 Which of the following compounds would you expect to be ionic?

- ☐ A H_2O
- ☐ B CO_2
- ☐ C SrCl_2
- ☐ D SO_2
- ☐ E H_2S

37 Which pair of elements is most likely to form an ionic compound with each other?

- ☐ A barium, chlorine
- ☐ B calcium, sodium
- ☐ C oxygen, fluorine
- ☐ D sulfur, carbon
- ☐ E nitrogen, hydrogen

**38 Of the choices below,
which one is not an ionic
compound?**

- ☐ A PCl_5
- ☐ B CrCl_6
- ☐ C RbCl
- ☐ D PbCl_2
- ☐ E NaCl

39 What is the formula of the compound formed between strontium ions and nitrogen ions?

- ☐ A SrN
- ☐ B Sr_3N_2
- ☐ C Sr_2N_3
- ☐ D SrN_2
- ☐ E SrN_3

40 Magnesium reacts with a certain element to form a compound with the general formula MgX . What would the most likely formula be for the compound formed between Lithium and element X?

- ☐ A Li_2X
- ☐ B LiX_2
- ☐ C Li_2X_3
- ☐ D Li_2X_2
- ☐ E LiX

41 The charge on the manganese in the salt MnCl_3 is _____.

- ☐ A 1+
- ☐ B 1-
- ☐ C 2+
- ☐ D 2-
- ☐ E 3+

42 Aluminum reacts with a certain nonmetallic element to form a compound with the general formula AlX . Element X is a diatomic gas at room temperature. Element X must be _____.

- ☐ A sulfur
- ☐ B fluorine
- ☐ C Bromine
- ☐ D nitrogen
- ☐ E oxygen

43 Predict the empirical formula of the ionic compound that forms from Calcium and fluorine.

- ☐ A CaF
- ☐ B Ca_2F
- ☐ C CaF_2
- ☐ D Ca_2F_3
- ☐ E Ca_3F_2

44 Predict the empirical formula of the ionic compound that forms from magnesium and fluorine.

- ☐ A Mg_2F_3
- ☐ B MgF
- ☐ C Mg_2F
- ☐ D Mg_3F_2
- ☐ E MgF_2

45 Predict the empirical formula of the ionic compound that forms from magnesium and oxygen.

- ☐ A Mg_2O
- ☐ B MgO
- ☐ C MgO_2
- ☐ D Mg_2O_2
- ☐ E Mg_3O_2

46 Predict the empirical formula of the ionic compound that forms from aluminum and oxygen.

- ☐ A AlO
- ☐ B Al_3O_2
- ☐ C Al_2O_3
- ☐ D AlO_2
- ☐ E Al_2O

**47 The correct name for SrO
is _____.**

- ☐ A strontium oxide
- ☐ B strontium hydroxide
- ☐ C strontium peroxide
- ☐ D strontium monoxide
- ☐ E strontium dioxide

48 The correct name for K_2S is

_____.

- ☐ A potassium sulfate
- ☐ B potassium disulfide
- ☐ C potassium bisulfide
- ☐ D potassium sulfide
- ☐ E dipotassium sulfate

49 The correct name for Al_2O_3 is _____.

- ☐ A aluminum oxide
- ☐ B dialuminum oxide
- ☐ C dialuminum trioxide
- ☐ D aluminum hydroxide
- ☐ E aluminum trioxide

50 The correct name for CaH_2 is _____.

- ☐ A hydrocalcium
- ☐ B calcium dihydride
- ☐ C calcium hydroxide
- ☐ D calcium dihydroxide
- ☐ E calcium hydride

51 The correct name of the compound Na_3N is

_____.

- ☐ A sodium nitride
- ☐ B sodium azide
- ☐ C sodium trinitride
- ☐ D sodium(III) nitride
- ☐ E trisodium nitride

**52 The ions Ca^{2+} and PO_4^{3-}
form a salt with the formula**

_____.

- ☐ A CaPO_4
- ☐ B $\text{Ca}_2(\text{PO}_4)_3$
- ☐ C Ca_2PO_4
- ☐ D $\text{Ca}(\text{PO}_4)_2$
- ☐ E $\text{Ca}_3(\text{PO}_4)_2$

53 The correct formula of iron (III) bromide is

_____.

- ☐ A FeBr_2
- ☐ B FeBr_3
- ☐ C FeBr
- ☐ D Fe_3Br_3
- ☐ E Fe_3Br

54 Magnesium and oxygen form an ionic compound with the formula

_____.

- ☐ A MgO
- ☐ B Mg₂O
- ☐ C MgO₂
- ☐ D Mg₂O₂
- ☐ E Mg₂O₃

55 The formula of ammonium carbonate is _____.

- ☐ A $(\text{NH}_4)_2\text{CO}_3$
- ☐ B NH_4CO_2
- ☐ C $(\text{NH}_3)_2\text{CO}_4$
- ☐ D $(\text{NH}_3)_2\text{CO}_3$
- ☐ E $\text{N}_2(\text{CO}_3)_3$

56 The correct name for $\text{Mg}(\text{ClO}_3)_2$ is _____.

- ☐ A magnesium chlorate
- ☐ B manganese chlorate
- ☐ C magnesium chloroxide
- ☐ D magnesium perchlorate
- ☐ E manganese perchlorate

57 What is the correct formula for ammonium sulfide?

- ☐ A NH_4SO_3
- ☐ B $(\text{NH}_4)_2\text{SO}_4$
- ☐ C $(\text{NH}_4)_2\text{S}$
- ☐ D NH_3S
- ☐ E N_2S_3

58 Which formula/name pair is incorrect?

- ☐ A $\text{Mn}(\text{NO}_2)_2$ manganese(II) nitrite
- ☐ B $\text{Mg}(\text{NO}_3)_2$ magnesium nitrate
- ☐ C $\text{Mn}(\text{NO}_3)_2$ manganese(II) nitrate
- ☐ D Mg_3N_2 magnesium nitrite
- ☐ E $\text{Mg}(\text{MnO}_4)_2$ magnesium permanganate

59 Which formula/name pair is incorrect?

- ☐ A FeSO_4 iron(II) sulfate
- ☐ B $\text{Fe}_2(\text{SO}_3)_3$ iron(III) sulfite
- ☐ C FeS iron(II) sulfide
- ☐ D FeSO_3 iron(II) sulfite
- ☐ E $\text{Fe}_2(\text{SO}_4)_3$ iron(III) sulfide

60 Which one of the following compounds is chromium (III) oxide?

- ☐ A Cr_2O_3
- ☐ B CrO_3
- ☐ C Cr_3O_2
- ☐ D Cr_3O
- ☐ E Cr_2O_4

61 Which one of the following compounds is copper(I) chloride?

- ☐ A CuCl
- ☐ B CuCl_2
- ☐ C Cu_2Cl
- ☐ D Cu_2Cl_3
- ☐ E Cu_3Cl_2

62 The correct name for MgF_2 is _____.

- ☐ A manganese difluoride
- ☐ B magnesium difluoride
- ☐ C monomagnesium difluoride
- ☐ D manganese bifluoride
- ☐ E magnesium fluoride

63 Element M reacts with fluorine to form an ionic compound with the formula MF_3 . The M-ion has 18 electrons. Element M is

_____.

- ☐ A P
- ☐ B Sc
- ☐ C Ar
- ☐ D Ca
- ☐ E Cr

64 When calcium reacts with sulfur the compound formed is _____.

- ☐ A Ca_2S_2
- ☐ B Ca_3S_2
- ☐ C CaS
- ☐ D CaS_2
- ☐ E Ca_2S_3

65 Chromium and chlorine form an ionic compound whose formula is CrCl_3 . The name of this compound is

_____.

- ☐ A chromium chlorine
- ☐ B chromium(III) chloride
- ☐ C monochromium trichloride
- ☐ D chromium(III) trichloride
- ☐ E chromic trichloride

66 The formula for aluminum hydroxide is _____.

- ☐ A AlOH
- ☐ B Al_3OH
- ☐ C $\text{Al}_2(\text{OH})_3$
- ☐ D $\text{Al}(\text{OH})_3$
- ☐ E Al_2O_3

67 The name of the ionic compound $(\text{NH}_4)_3\text{PO}_4$ is

_____.

- ☐ A ammonium phosphate
- ☐ B tetrammonium phosphate
- ☐ C nitrogen hydrogen phosphate
- ☐ D ammonia phosphide
- ☐ E triammonium phosphate

68 Which metal is capable of forming more than one cation?

- ☐ A Li
- ☐ B Ba
- ☐ C Sr
- ☐ D Al
- ☐ E Sn

69 The correct name for $\text{Cu}(\text{CN})_2$ is _____.

- ☐ A Copper (I) cyanide
- ☐ B Copper cyanate
- ☐ C Copper carbonate
- ☐ D Copper(II) cyanide
- ☐ E Copper (I) nitride

70 The correct name for Na_2O_2 is _____.

- ☐ A sodium oxide
- ☐ B sodium dioxide
- ☐ C disodium oxide
- ☐ D sodium peroxide
- ☐ E disodium dioxide

71 Barium reacts with a polyatomic ion to form a compound with the general formula $\text{Ba}_3(\text{X})_2$. What would be the most likely formula for the compound formed between sodium and the polyatomic ion X?

- ☐ A NaX
- ☐ B Na_2X
- ☐ C Na_2X_2
- ☐ D Na_3X
- ☐ E N_3X_2

72 Aluminum reacts with a certain nonmetallic element to form a compound with the general formula Al_2X_3 . Element X must be from Group _____ of the Periodic Table of Elements.

- ☐ A 3A (13)
- ☐ B 4A (14)
- ☐ C 5A (15)
- ☐ D 6A (16)
- ☐ E 7A (17)

73 The formula for a salt is XBr. The X-ion in this salt has 46 electrons. The metal X is ____.

- ☐ A Ag
- ☐ B Pd
- ☐ C Cd
- ☐ D Cu
- ☐ E Cs

**74 The charge on the iron ion
in the salt Fe_2O_3 is**

_____.

- ☐ A +1
- ☐ B +2
- ☐ C +3
- ☐ D -5
- ☐ E -6

75 Which metal is not required to have its charge specified in the names of ionic compounds it forms?

- ☐ A Mn
- ☐ B Fe
- ☐ C Cu
- ☐ D Ca
- ☐ E Pb

