

LC 16 : classification périodique

Niveau : CPGE

Prérequis :

- Configuration électronique d'un atome, niveaux d'énergie
- Oxydants et réducteurs : réactions d'oxydo-réduction
- Cristallographie : paramètre de maille

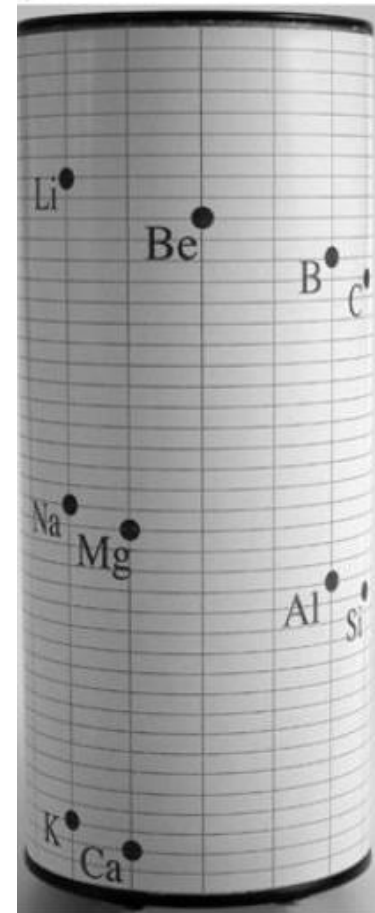
Raisonnement historique : découverte des éléments

Avant 1700	1700-1799	1800-1849	1850-1899
Antimoine	Azote	Aluminium	Actinium
Argent	Béryllium	Baryum	Argon
Arsenic	Bismuth	Bore	Cesium
Carbone	Chlore	Brome	Dysprosium
Cuivre	Chrome	Cadmium	Gadolinium
Etain	Cobalt	Calcium	Gallium
Fer	Fluor	Cérium	Germanium
Mercure	Hydrogène	Erbium	Hélium
Or	Manganèse	Iode	Holmium
Phosphore	Molybdène	Lanthane	Indium
Plomb	Nickel	Iridium	Krypton
Soufre	Oxygène	Lithium	Néodyme
	Platine	Magnésium	Néon
	Strontium	Niobium	Polonium
	Tellure	Osmium	Praséodyme
	Titane	Palladium	Radium
	Tungstène	Potassium	Rhodium
	Uranium	Rubidium	Ruthénium
	Yttrium	Sélénium	Samarium
	Zinc	Silicium	Scandium
	Zirconium	Sodium	Thallium
		Tantale	Thulium
		Thorium	Xénon
		Vanadium	Ytterbium
(12)	(21)	(24)	(24)

Raisonnement historique : classification en masse par Dalton (1808)



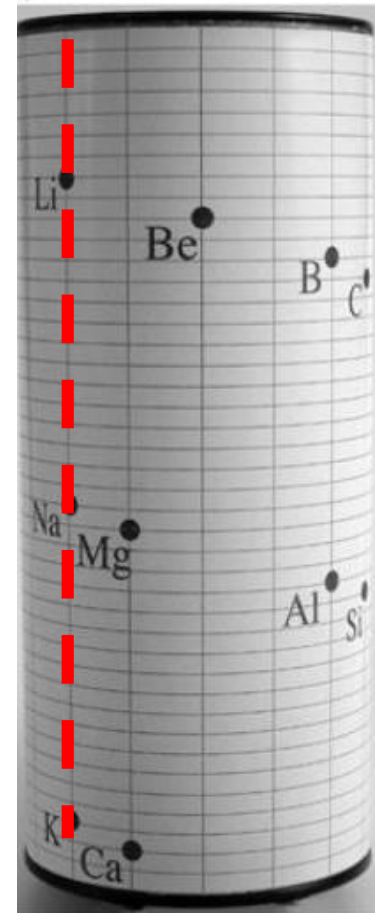
Raisonnement historique : classification en masse et par propriétés par Chancourtois et vis tellurique



Raisonnement historique : classification en masse et par propriétés par Chancourtois et vis tellurique



Mêmes propriétés



Raisonnement historique : classification par Mendeleïev (1869)



ОПЫТЪ СИСТЕМЫ ЭЛЕМЕНТОВЪ.
ОСНОВАННОЙ НА ИХЪ АТОМНОМЪ ВѢСѢ И ХИМИЧЕСКОМЪ СХОДСТВѢ.

	Ti=50	Zr=90	?=180.
	V=51	Nb=94	Ta=182.
	Cr=52	Mo=96	W=186.
	Mn=55	Rh=104,4	Pt=197,1
	Fe=56	Ru=104,4	Ir=198.
	Ni=Co=59	Pd=106,6	Os=199.
H=1	Cu=63,4	Ag=108	Hg=200.
Be=9,4	Mg=24	Zn=65,2	Cd=112
B=11	Al=27,1	?=68	Ur=116
C=12	Si=28	?=70	Sn=118
N=14	P=31	As=75	Sb=122
O=16	S=32	Se=79,4	Te=128?
F=19	Cl=35,5	Br=80	I=127
Li=7	Na=23	K=39	Rb=85,4
		Ca=40	Sr=87,6
		?=45	Ce=92
		?Er=56	La=94
		?Yt=60	Di=95
		?In=75,5	Th=118?
		Cs=133	Tl=204.
		Ba=137	Pb=207.

Д. Менделѣевъ

Configuration et blocs

PERIODIC TABLE OF ELEMENTS

<div>PubChem</div>																		2																	
1 H Hydrogen 1s ¹																		He Helium 1s ²																	
3 Li Lithium [He]2s ¹	4 Be Beryllium [He]2s ²																	5 B Boron [He]2s ² 2p ¹	6 C Carbon [He]2s ² 2p ²	7 N Nitrogen [He]2s ² 2p ³	8 O Oxygen [He]2s ² 2p ⁴	9 F Fluorine [He]2s ² 2p ⁵	10 Ne Neon [He]2s ² 2p ⁶												
11 Na Sodium [Ne]3s ¹	12 Mg Magnesium [Ne]3s ²																	13 Al Aluminum [Ne]3s ² 3p ¹	14 Si Silicon [Ne]3s ² 3p ²	15 P Phosphorus [Ne]3s ² 3p ³	16 S Sulfur [Ne]3s ² 3p ⁴	17 Cl Chlorine [Ne]3s ² 3p ⁵	18 Ar Argon [Ne]3s ² 3p ⁶												
19 K Potassium [Ar]4s ¹	20 Ca Calcium [Ar]4s ²	21 Sc Scandium [Ar]3d ¹ 4s ²	22 Ti Titanium [Ar]3d ² 4s ²	23 V Vanadium [Ar]3d ³ 4s ²	24 Cr Chromium [Ar]3d ⁵ 4s ¹	25 Mn Manganese [Ar]3d ⁵ 4s ²	26 Fe Iron [Ar]3d ⁶ 4s ²	27 Co Cobalt [Ar]3d ⁷ 4s ²	28 Ni Nickel [Ar]3d ⁸ 4s ²	29 Cu Copper [Ar]3d ¹⁰ 4s ¹	30 Zn Zinc [Ar]3d ¹⁰ 4s ²	31 Ga Gallium [Ar]3d ¹⁰ 4s ² 4p ¹	32 Ge Germanium [Ar]3d ¹⁰ 4s ² 4p ²	33 As Arsenic [Ar]3d ¹⁰ 4s ² 4p ³	34 Se Selenium [Ar]3d ¹⁰ 4s ² 4p ⁴	35 Br Bromine [Ar]3d ¹⁰ 4s ² 4p ⁵	36 Kr Krypton [Ar]3d ¹⁰ 4s ² 4p ⁶	37 Rb Rubidium [Kr]5s ¹	38 Sr Strontium [Kr]5s ²	39 Y Yttrium [Kr]4d ¹ 5s ²	40 Zr Zirconium [Kr]4d ² 5s ²	41 Nb Niobium [Kr]4d ⁴ 5s ¹	42 Mo Molybdenum [Kr]4d ⁵ 5s ¹	43 Tc Technetium [Kr]4d ⁵ 5s ²	44 Ru Ruthenium [Kr]4d ⁷ 5s ¹	45 Rh Rhodium [Kr]4d ⁸ 5s ¹	46 Pd Palladium [Kr]4d ¹⁰	47 Ag Silver [Kr]4d ¹⁰ 5s ¹	48 Cd Cadmium [Kr]4d ¹⁰ 5s ²	49 In Indium [Kr]4d ¹⁰ 5s ² 5p ¹	50 Sn Tin [Kr]4d ¹⁰ 5s ² 5p ²	51 Sb Antimony [Kr]4d ¹⁰ 5s ² 5p ³	52 Te Tellurium [Kr]4d ¹⁰ 5s ² 5p ⁴	53 I Iodine [Kr]4d ¹⁰ 5s ² 5p ⁵	54 Xe Xenon [Kr]4d ¹⁰ 5s ² 5p ⁶
55 Cs Cesium [Xe]6s ¹	56 Ba Barium [Xe]6s ²	*	72 Hf Hafnium [Xe]4f ¹⁴ 5d ² 6s ²	73 Ta Tantalum [Xe]4f ¹⁴ 5d ³ 6s ²	74 W Tungsten [Xe]4f ¹⁴ 5d ⁴ 6s ²	75 Re Rhenium [Xe]4f ¹⁴ 5d ⁵ 6s ²	76 Os Osmium [Xe]4f ¹⁴ 5d ⁶ 6s ²	77 Ir Iridium [Xe]4f ¹⁴ 5d ⁷ 6s ²	78 Pt Platinum [Xe]4f ¹⁴ 5d ⁹ 6s ¹	79 Au Gold [Xe]4f ¹⁴ 5d ¹⁰ 6s ¹	80 Hg Mercury [Xe]4f ¹⁴ 5d ¹⁰ 6s ²	81 Tl Thallium [Xe]4f ¹⁴ 5d ¹⁰ 6s ² 6p ¹	82 Pb Lead [Xe]4f ¹⁴ 5d ¹⁰ 6s ² 6p ²	83 Bi Bismuth [Xe]4f ¹⁴ 5d ¹⁰ 6s ² 6p ³	84 Po Polonium [Xe]4f ¹⁴ 5d ¹⁰ 6s ² 6p ⁴	85 At Astatine [Xe]4f ¹⁴ 5d ¹⁰ 6s ² 6p ⁵	86 Rn Radon [Xe]4f ¹⁴ 5d ¹⁰ 6s ² 6p ⁶	87 Fr Francium [Rn]7s ¹	88 Ra Radium [Rn]7s ²	**	104 Rf Rutherfordium [Rn]5f ¹⁴ 6d ² 7s ²	105 Db Dubnium [Rn]5f ¹⁴ 6d ³ 7s ²	106 Sg Seaborgium [Rn]5f ¹⁴ 6d ⁴ 7s ²	107 Bh Bohrium [Rn]5f ¹⁴ 6d ⁵ 7s ²	108 Hs Hassium [Rn]5f ¹⁴ 6d ⁶ 7s ²	109 Mt Meitnerium [Rn]5f ¹⁴ 6d ⁷ 7s ²	110 Ds Darmstadtium [Rn]5f ¹⁴ 6d ⁸ 7s ²	111 Rg Roentgenium [Rn]5f ¹⁴ 6d ⁹ 7s ²	112 Cn Copernicium [Rn]5f ¹⁴ 6d ¹⁰ 7s ²	113 Nh Nihonium [Rn]5f ¹⁴ 6d ¹⁰ 7s ² 7p ¹	114 Fl Flerovium [Rn]5f ¹⁴ 6d ¹⁰ 7s ² 7p ²	115 Mc Moscovium [Rn]5f ¹⁴ 6d ¹⁰ 7s ² 7p ³	116 Lv Livermorium [Rn]5f ¹⁴ 6d ¹⁰ 7s ² 7p ⁴	117 Ts Tennessine [Rn]5f ¹⁴ 6d ¹⁰ 7s ² 7p ⁵	118 Og Oganesson [Rn]5f ¹⁴ 6d ¹⁰ 7s ² 7p ⁶
		*	57 La Lanthanum [Xe]5d ¹ 6s ²	58 Ce Cerium [Xe]4f ¹ 5d ¹ 6s ²	59 Pr Praseodymium [Xe]4f ³ 6s ²	60 Nd Neodymium [Xe]4f ⁴ 6s ²	61 Pm Promethium [Xe]4f ⁵ 6s ²	62 Sm Samarium [Xe]4f ⁶ 6s ²	63 Eu Europium [Xe]4f ⁷ 6s ²	64 Gd Gadolinium [Xe]4f ⁷ 5d ¹ 6s ²	65 Tb Terbium [Xe]4f ⁹ 6s ²	66 Dy Dysprosium [Xe]4f ¹⁰ 6s ²	67 Ho Holmium [Xe]4f ¹¹ 6s ²	68 Er Erbium [Xe]4f ¹² 6s ²	69 Tm Thulium [Xe]4f ¹³ 6s ²	70 Yb Ytterbium [Xe]4f ¹⁴ 6s ²	71 Lu Lutetium [Xe]4f ¹⁴ 5d ¹ 6s ²																		
		**	89 Ac Actinium [Rn]6d ¹ 7s ²	90 Th Thorium [Rn]6d ² 7s ²	91 Pa Protactinium [Rn]5f ² 6d ¹ 7s ²	92 U Uranium [Rn]5f ³ 6d ¹ 7s ²	93 Np Neptunium [Rn]5f ⁴ 6d ¹ 7s ²	94 Pu Plutonium [Rn]5f ⁶ 7s ²	95 Am Americium [Rn]5f ⁷ 7s ²	96 Cm Curium [Rn]5f ⁷ 6d ¹ 7s ²	97 Bk Berkelium [Rn]5f ⁹ 7s ²	98 Cf Californium [Rn]5f ¹⁰ 7s ²	99 Es Einsteinium [Rn]5f ¹¹ 7s ²	100 Fm Fermium [Rn]5f ¹² 7s ²	101 Md Mendelevium [Rn]5f ¹³ 7s ²	102 No Nobelium [Rn]5f ¹⁴ 7s ²	103 Lr Lawrencium [Rn]5f ¹⁴ 6d ¹ 7s ²																		

<https://pubchem.ncbi.nlm.nih.gov/periodic-table/#view=table&property=ElectronConfiguration>

Energie d'ionisation

PERIODIC TABLE OF ELEMENTS

1

H

Hydrogen

[1s¹]

3

Li

Lithium

[He]2s¹

4

Be

Beryllium

[He]2s²

11

Na

Sodium

[Ne]3s¹

12

Mg

Magnesium

[Ne]3s²

19

K

Potassium

[Ar]4s¹

20

Ca

Calcium

[Ar]4s²

21

Sc

Scandium

[Ar]3d¹4s²

22

Ti

Titanium

[Ar]3d²4s²

23

V

Vanadium

[Ar]3d³4s²

24

Cr

Chromium

[Ar]3d⁵4s¹

25

Mn

Manganese

[Ar]3d⁵4s²

26

Fe

Iron

[Ar]3d⁶4s²

27

Co

Cobalt

[Ar]3d⁷4s²

28

Ni

Nickel

[Ar]3d⁸4s²

29

Cu

Copper

[Ar]3d¹⁰4s¹

30

Zn

Zinc

[Ar]3d¹⁰4s²

31

Ga

Gallium

[Ar]3d¹⁰4s²4p¹

32

Ge

Germanium

[Ar]3d¹⁰4s²4p²

33

As

Arsenic

[Ar]3d¹⁰4s²4p³

34

Se

Selenium

[Ar]3d¹⁰4s²4p⁴

35

Br

Bromine

[Ar]3d¹⁰4s²4p⁵

36

Kr

Krypton

[Ar]3d¹⁰4s²4p⁶

37

Rb

Rubidium

[Kr]5s¹

38

Sr

Strontium

[Kr]5s²

39

Y

Yttrium

[Kr]4d¹5s²

40

Zr

Zirconium

[Kr]4d²5s²

41

Nb

Niobium

[Kr]4d⁴5s¹

42

Mo

Molybdenum

[Kr]4d⁵5s¹

43

Tc

Technetium

[Kr]4d⁵5s²

44

Ru

Ruthenium

[Kr]4d⁷5s¹

45

Rh

Rhodium

[Kr]4d⁸5s¹

46

Pd

Palladium

[Kr]4d¹⁰

47

Ag

Silver

[Kr]4d¹⁰5s¹

48

Cd

Cadmium

[Kr]4d¹⁰5s²

49

In

Indium

[Kr]4d¹⁰5s²5p¹

50

Sn

Tin

[Kr]4d¹⁰5s²5p²

51

Sb

Antimony

[Kr]4d¹⁰5s²5p³

52

Te

Tellurium

[Kr]4d¹⁰5s²5p⁴

53

I

Iodine

[Kr]4d¹⁰5s²5p⁵

54

Xe

Xenon

[Kr]4d¹⁰5s²5p⁶

55

Cs

Cesium

[Xe]6s¹

56

Ba

Barium

[Xe]6s²

72

Hf

Hafnium

[Xe]4f¹⁴5d²6s²

73

Ta

Tantalum

[Xe]4f¹⁴5d³6s²

74

W

Tungsten

[Xe]4f¹⁴5d⁴6s²

75

Re

Rhenium

[Xe]4f¹⁴5d⁵6s²

76

Os

Osmium

[Xe]4f¹⁴5d⁶6s²

77

Ir

Iridium

[Xe]4f¹⁴5d⁷6s²

78

Pt

Platinum

[Xe]4f¹⁴5d⁹6s¹

79

Au

Gold

[Xe]4f¹⁴5d¹⁰6s¹

80

Hg

Mercury

[Xe]4f¹⁴5d¹⁰6s²

81

Tl

Thallium

[Xe]4f¹⁴5d¹⁰6s²6p¹

82

Pb

Lead

[Xe]4f¹⁴5d¹⁰6s²6p²

83

Bi

Bismuth

[Xe]4f¹⁴5d¹⁰6s²6p³

84

Po

Polonium

[Xe]4f¹⁴5d¹⁰6s²6p⁴

85

At

Astatine

[Xe]4f¹⁴5d¹⁰6s²6p⁵

86

Rn

Radon

[Xe]4f¹⁴5d¹⁰6s²6p⁶

87

Fr

Francium

[Rn]7s¹

88

Ra

Radium

[Rn]7s²

104

Rf

Rutherfordium

[Rn]5f¹⁴6d²7s²

105

Db

Dubnium

[Rn]5f¹⁴6d³7s²

106

Sg

Seaborgium

[Rn]5f¹⁴6d⁴7s²

107

Bh

Bohrium

[Rn]5f¹⁴6d⁵7s²

108

Hs

Hassium

[Rn]5f¹⁴6d⁶7s²

109

Mt

Meitnerium

[Rn]5f¹⁴6d⁷7s²

110

Ds

Darmstadtium

[Rn]5f¹⁴6d⁸7s²

111

Rg

Roentgenium

[Rn]5f¹⁴6d⁹7s²

112

Cn

Copernicium

[Rn]5f¹⁴6d¹⁰7s²

113

Nh

Nihonium

[Rn]5f¹⁴6d¹⁰7s²7p¹

114

Fl

Flerovium

[Rn]5f¹⁴6d¹⁰7s²7p²

115

Mc

Moscovium

[Rn]5f¹⁴6d¹⁰7s²7p³

116

Lv

Livermorium

[Rn]5f¹⁴6d¹⁰7s²7p⁴

117

Ts

Tennessine

[Rn]5f¹⁴6d¹⁰7s²7p⁵

118

Og

Oganesson

[Rn]5f¹⁴6d¹⁰7s²7p⁶

57

La

Lanthanum

[Xe]5d¹6s²

58

Ce

Cerium

[Xe]4f¹5d¹6s²

59

Pr

Praseodymium

[Xe]4f³6s²

60

Nd

Neodymium

[Xe]4f⁴6s²

61

Pm

Promethium

[Xe]4f⁵6s²

62

Sm

Samarium

[Xe]4f⁶6s²

63

Eu

Europium

[Xe]4f⁷6s²

64

Gd

Gadolinium

[Xe]4f⁷5d¹6s²

65

Tb

Terbium

[Xe]4f⁹6s²

66

Dy

Dysprosium

[Xe]4f¹⁰6s²

67

Ho

Holmium

[Xe]4f¹¹6s²

68

Er

Erbium

[Xe]4f¹²6s²

69

Tm

Thulium

[Xe]4f¹³6s²

70

Yb

Ytterbium

[Xe]4f¹⁴6s²

71

Lu

Lutetium

[Xe]4f¹⁴5d¹6s²

89

Ac

Actinium

[Rn]6d¹7s²

90

Th

Thorium

[Rn]6d²7s²

91

Pa

Protactinium

[Rn]5f²6d¹7s²

92

U

Uranium

[Rn]5f³6d¹7s²

93

Np

Neptunium

[Rn]5f⁴6d¹7s²

94

Pu

Plutonium

[Rn]5f⁶7s²

95

Am

Americium

[Rn]5f⁷7s²

96

Cm

Curium

[Rn]5f⁸7s²

97

Bk

Berkelium

[Rn]5f⁹7s²

98

Cf

Californium

[Rn]5f¹⁰7s²

99

Es

Einsteinium

[Rn]5f¹¹7s²

100

Fm

Fermium

[Rn]5f¹²7s²

101

Md

Mendelevium

[Rn]5f¹³7s²

102

No

Nobelium

[Rn]5f¹⁴7s²

103

Lr

Lawrencium

[Rn]5f¹⁴6d¹7s²

1

H

Hydrogen

[1s¹]

2

He

Helium

[1s²]

3

Li

Lithium

[He]2s¹

4

Be

Beryllium

[He]2s²

5

B

Boron

[He]2s²2p¹

6

C

Carbon

[He]2s²2p²

7

N

Nitrogen

[He]2s²2p³

8

O

Oxygen

[He]2s²2p⁴

9

F

Fluorine

[He]2s²2p⁵

10

Ne

Neon

[He]2s²2p⁶

11

Na

Sodium

[Ne]3s¹

12

Mg

Magnesium

[Ne]3s²

13

Al

Aluminum

[Ne]3s²3p¹

14

Si

Silicon

[Ne]3s²3p²

15

P

Phosphorus

[Ne]3s²3p³

16

S

Sulfur

[Ne]3s²3p⁴

17

Cl

Chlorine

[Ne]3s²3p⁵

18

Ar

Argon

[Ne]3s²3p⁶

19

K

Potassium

[Ar]4s¹

20

Ca

Calcium

[Ar]4s²

21

Sc

Scandium

[Ar]3d¹4s²

22

Ti

Titanium

[Ar]3d²4s²

23

V

Vanadium

[Ar]3d³4s²

24

Cr

Chromium

[Ar]3d⁵4s¹

25

Mn

Manganese

[Ar]3d⁵4s²

26

Fe

Iron

[Ar]3d⁶4s²

27

Co

Cobalt

[Ar]3d⁷4s²

28

Ni

Nickel

[Ar]3d⁸4s²

29

Cu

Copper

[Ar]3d¹⁰4s¹

30

Zn

Zinc

[Ar]3d¹⁰4s²

31

Ga

Gallium

[Ar]3d¹⁰4s²4p¹

32

Ge

Germanium

[Ar]3d¹⁰4s²4p²

33

As

Arsenic

[Ar]3d¹⁰4s²4p³

34

Se

Selenium

[Ar]3d¹⁰4s²4p⁴

35

Br

Bromine

[Ar]3d¹⁰4s²4p⁵

36

Kr

Krypton

[Ar]3d¹⁰4s²4p⁶

37

Rb

Rubidium

[Kr]5s¹

38

Sr

Strontium

[Kr]5s²

39

Y

Yttrium

[Kr]4d¹5s²

40

Zr

Zirconium

[Kr]4d²5s²

41

Nb

Niobium

[Kr]4d⁴5s¹

42

Mo

Molybdenum

[Kr]4d⁵5s¹

43

Tc

Technetium

[Kr]4d⁵5s²

44

Ru

Ruthenium

[Kr]4d⁷5s¹

45

Rh

Rhodium

[Kr]4d⁸5s¹

46

Pd

Palladium

[Kr]4d¹⁰

47

Ag

Silver

[Kr]4d¹⁰5s¹

48

Cd

Cadmium

[Kr]4d¹⁰5s²

49

In

Indium

[Kr]4d¹⁰5s²5p¹

50

Sn

Tin

[Kr]4d¹⁰5s²5p²

51

Sb

Antimony

[Kr]4d¹⁰5s²5p³

52

Te

Tellurium

[Kr]4d¹⁰5s²5p⁴

53

I

Iodine

[Kr]4d¹⁰5s²5p⁵

54

Xe

Xenon

[Kr]4d¹⁰5s²5p⁶

55

Cs

Cesium

[Xe]6s¹

56

Ba

Barium

[Xe]6s²

72

Hf

Hafnium

[Xe]4f¹⁴5d²6s²

73

Ta

Tantalum

[Xe]4f¹⁴5d³6s²

74

W

Tungsten

[Xe]4f¹⁴5d⁴6s²

75

Re

Rhenium

[Xe]4f¹⁴5d⁵6s²

76

Os

Osmium

[Xe]4f¹⁴5d⁶6s²

77

Ir

Iridium

[Xe]4f¹⁴5d⁷6s²

78

Pt

Platinum

[Xe]4f¹⁴5d⁹6s¹

79

Au

Gold

[Xe]4f¹⁴5d¹⁰6s¹

80

Hg

Mercury

[Xe]4f¹⁴5d¹⁰6s²

81

Tl

Thallium

[Xe]4f¹⁴5d¹⁰6s²6p¹

82

Pb

Lead

[Xe]4f¹⁴5d¹⁰6s²6p²

83

Bi

Bismuth

[Xe]4f¹⁴5d¹⁰6s²6p³

84

Po

Polonium

[Xe]4f¹⁴5d¹⁰6s²6p⁴

85

At

Astatine

[Xe]4f¹⁴5d¹⁰6s²6p⁵

86

Rn

Radon

[Xe]4f¹⁴5d¹⁰6s²6p⁶

87

Fr

Francium

[Rn]7s¹

88

Ra

Radium

[Rn]7s²

104

Rf

Rutherfordium

[Rn]5f¹⁴6d²7s²

105

Db

Dubnium

[Rn]5f¹⁴6d³7s²

106

Sg

Seaborgium

[Rn]5f¹⁴6d⁴7s²

107

Bh

Bohrium

[Rn]5f¹⁴6d⁵7s²

108

Hs

Hassium

[Rn]5f¹⁴6d⁶7s²

109

Mt

Meitnerium

[Rn]5f¹⁴6d⁷7s²

110

Ds

Darmstadtium

[Rn]5f¹⁴6d⁸7s²

111

Rg

Roentgenium

[Rn]5f¹⁴6d⁹7s²

112

Cn

Copernicium

[Rn]5f¹⁴6d¹⁰7s²

113

Nh

Nihonium

[Rn]5f¹⁴6d¹⁰7s²7p¹

114

Fl

Flerovium

[Rn]5f¹⁴6d¹⁰7s²7p²

115

Mc

Moscovium

[Rn]5f¹⁴6d¹⁰7s²7p³

116

Lv

Livermorium

[Rn]5f¹⁴6d¹⁰7s²7p⁴

117

Ts

Tennessine

[Rn]5f¹⁴6d¹⁰7s²7p⁵

118

Og

Oganesson

[Rn]5f¹⁴6d¹⁰7s²7p⁶

57

La

Lanthanum

[Xe]5d¹6s²

58

Ce

Cerium

[Xe]4f¹5d¹6s²

59

Pr

Praseodymium

[Xe]4f³6s²

60

Nd

Neodymium

[Xe]4f⁴6s²

61

Pm

Promethium

[Xe]4f⁵6s²

62

Sm

Samarium

[Xe]4f⁶6s²

63

Eu

Europium

[Xe]4f⁷6s²

64

Gd

Gadolinium

[Xe]4f⁷5d¹6s²

65

Tb

Terbium

[Xe]4f⁹6s²

66

Dy

Dysprosium

[Xe]4f¹⁰6s²

67

Ho

Holmium

[Xe]4f¹¹6s²

68

Er

Erbium

[Xe]4f¹²6s²

69

Tm

Thulium

[Xe]4f¹³6s²

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PERIODIC TABLE OF ELEMENTS

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Electronégativité

PERIODIC TABLE OF ELEMENTS

<div>PubChem</div>																																			
1 H Hydrogen [1s ¹]		1 H Hydrogen 1s ¹																		2 He Helium [1s ²]															
3 Li Lithium [He]2s ¹		4 Be Beryllium [He]2s ²																				5 B Boron [He]2s ² 2p ¹		6 C Carbon [He]2s ² 2p ²		7 N Nitrogen [He]2s ² 2p ³		8 O Oxygen [He]2s ² 2p ⁴		9 F Fluorine [He]2s ² 2p ⁵		10 Ne Neon [He]2s ² 2p ⁶			
11 Na Sodium [Ne]3s ¹		12 Mg Magnesium [Ne]3s ²																				13 Al Aluminum [Ne]3s ² 3p ¹		14 Si Silicon [Ne]3s ² 3p ²		15 P Phosphorus [Ne]3s ² 3p ³		16 S Sulfur [Ne]3s ² 3p ⁴		17 Cl Chlorine [Ne]3s ² 3p ⁵		18 Ar Argon [Ne]3s ² 3p ⁶			
19 K Potassium [Ar]4s ¹		20 Ca Calcium [Ar]4s ²		21 Sc Scandium [Ar]3d ¹ 4s ²		22 Ti Titanium [Ar]3d ² 4s ²		23 V Vanadium [Ar]3d ³ 4s ²		24 Cr Chromium [Ar]3d ⁵ 4s ¹		25 Mn Manganese [Ar]3d ⁵ 4s ²		26 Fe Iron [Ar]3d ⁶ 4s ²		27 Co Cobalt [Ar]3d ⁷ 4s ²		28 Ni Nickel [Ar]3d ⁸ 4s ²		29 Cu Copper [Ar]3d ¹⁰ 4s ¹		30 Zn Zinc [Ar]3d ¹⁰ 4s ²		31 Ga Gallium [Ar]3d ¹⁰ 4s ² 4p ¹		32 Ge Germanium [Ar]3d ¹⁰ 4s ² 4p ²		33 As Arsenic [Ar]3d ¹⁰ 4s ² 4p ³		34 Se Selenium [Ar]3d ¹⁰ 4s ² 4p ⁴		35 Br Bromine [Ar]3d ¹⁰ 4s ² 4p ⁵		36 Kr Krypton [Ar]3d ¹⁰ 4s ² 4p ⁶	
37 Rb Rubidium [Kr]5s ¹		38 Sr Strontium [Kr]5s ²		39 Y Yttrium [Kr]4d ¹ 5s ²		40 Zr Zirconium [Kr]4d ² 5s ²		41 Nb Niobium [Kr]4d ⁴ 5s ¹		42 Mo Molybdenum [Kr]4d ⁵ 5s ¹		43 Tc Technetium [Kr]4d ⁵ 5s ²		44 Ru Ruthenium [Kr]4d ⁷ 5s ¹		45 Rh Rhodium [Kr]4d ⁸ 5s ¹		46 Pd Palladium [Kr]4d ¹⁰		47 Ag Silver [Kr]4d ¹⁰ 5s ¹		48 Cd Cadmium [Kr]4d ¹⁰ 5s ²		49 In Indium [Kr]4d ¹⁰ 5s ² 5p ¹		50 Sn Tin [Kr]4d ¹⁰ 5s ² 5p ²		51 Sb Antimony [Kr]4d ¹⁰ 5s ² 5p ³		52 Te Tellurium [Kr]4d ¹⁰ 5s ² 5p ⁴		53 I Iodine [Kr]4d ¹⁰ 5s ² 5p ⁵		54 Xe Xenon [Kr]4d ¹⁰ 5s ² 5p ⁶	
55 Cs Cesium [Xe]6s ¹		56 Ba Barium [Xe]6s ²		•		72 Hf Hafnium [Xe]4f ¹⁴ 5d ² 6s ²		73 Ta Tantalum [Xe]4f ¹⁴ 5d ³ 6s ²		74 W Tungsten [Xe]4f ¹⁴ 5d ⁴ 6s ²		75 Re Rhenium [Xe]4f ¹⁴ 5d ⁵ 6s ²		76 Os Osmium [Xe]4f ¹⁴ 5d ⁶ 6s ²		77 Ir Iridium [Xe]4f ¹⁴ 5d ⁷ 6s ²		78 Pt Platinum [Xe]4f ¹⁴ 5d ⁹ 6s ¹		79 Au Gold [Xe]4f ¹⁴ 5d ¹⁰ 6s ¹		80 Hg Mercury [Xe]4f ¹⁴ 5d ¹⁰ 6s ²		81 Tl Thallium [Xe]4f ¹⁴ 5d ¹⁰ 6s ² 6p ¹		82 Pb Lead [Xe]4f ¹⁴ 5d ¹⁰ 6s ² 6p ²		83 Bi Bismuth [Xe]4f ¹⁴ 5d ¹⁰ 6s ² 6p ³		84 Po Polonium [Xe]4f ¹⁴ 5d ¹⁰ 6s ² 6p ⁴		85 At Astatine [Xe]4f ¹⁴ 5d ¹⁰ 6s ² 6p ⁵		86 Rn Radon [Xe]4f ¹⁴ 5d ¹⁰ 6s ² 6p ⁶	
87 Fr Francium [Rn]7s ¹		88 Ra Radium [Rn]7s ²		••		104 Rf Rutherfordium [Rn]5f ¹⁴ 6d ² 7s ²		105 Db Dubnium [Rn]5f ¹⁴ 6d ³ 7s ²		106 Sg Seaborgium [Rn]5f ¹⁴ 6d ⁴ 7s ²		107 Bh Bohrium [Rn]5f ¹⁴ 6d ⁵ 7s ²		108 Hs Hassium [Rn]5f ¹⁴ 6d ⁶ 7s ²		109 Mt Meitnerium [Rn]5f ¹⁴ 6d ⁷ 7s ²		110 Ds Darmstadtium [Rn]5f ¹⁴ 6d ⁸ 7s ²		111 Rg Roentgenium [Rn]5f ¹⁴ 6d ⁹ 7s ²		112 Cn Copernicium [Rn]5f ¹⁴ 6d ¹⁰ 7s ²		113 Nh Nihonium [Rn]5f ¹⁴ 6d ¹⁰ 7s ² 7p ¹		114 Fl Flerovium [Rn]5f ¹⁴ 6d ¹⁰ 7s ² 7p ²		115 Mc Moscovium [Rn]5f ¹⁴ 6d ¹⁰ 7s ² 7p ³		116 Lv Livermorium [Rn]5f ¹⁴ 6d ¹⁰ 7s ² 7p ⁴		117 Ts Tennessine [Rn]5f ¹⁴ 6d ¹⁰ 7s ² 7p ⁵		118 Og Oganesson [Rn]5f ¹⁴ 6d ¹⁰ 7s ² 7p ⁶	
•		57 La Lanthanum [Xe]5d ¹ 6s ²		58 Ce Cerium [Xe]4f ¹ 5d ¹ 6s ²		59 Pr Praseodymium [Xe]4f ³ 6s ²		60 Nd Neodymium [Xe]4f ⁴ 6s ²		61 Pm Promethium [Xe]4f ⁵ 6s ²		62 Sm Samarium [Xe]4f ⁶ 6s ²		63 Eu Europium [Xe]4f ⁷ 6s ²		64 Gd Gadolinium [Xe]4f ⁷ 5d ¹ 6s ²		65 Tb Terbium [Xe]4f ⁹ 6s ²		66 Dy Dysprosium [Xe]4f ¹⁰ 6s ²		67 Ho Holmium [Xe]4f ¹¹ 6s ²		68 Er Erbium [Xe]4f ¹² 6s ²		69 Tm Thulium [Xe]4f ¹³ 6s ²		70 Yb Ytterbium [Xe]4f ¹⁴ 6s ²		71 Lu Lutetium [Xe]4f ¹⁴ 5d ¹ 6s ²					
••		89 Ac Actinium [Rn]6d ¹ 7s ²		90 Th Thorium [Rn]6d ² 7s ²		91 Pa Protactinium [Rn]5f ² 6d ¹ 7s ²		92 U Uranium [Rn]5f ³ 6d ¹ 7s ²		93 Np Neptunium [Rn]5f ⁴ 6d ¹ 7s ²		94 Pu Plutonium [Rn]5f ⁶ 7s ²		95 Am Americium [Rn]5f ⁷ 7s ²		96 Cm Curium [Rn]5f ⁸ 7s ²		97 Bk Berkelium [Rn]5f ⁹ 7s ²		98 Cf Californium [Rn]5f ¹⁰ 7s ²		99 Es Einsteinium [Rn]5f ¹¹ 7s ²		100 Fm Fermium [Rn]5f ¹² 7s ²		101 Md Mendelevium [Rn]5f ¹³ 7s ²		102 No Nobelium [Rn]5f ¹⁴ 7s ²		103 Lr Lawrencium [Rn]5f ¹⁴ 6d ¹ 7s ²					

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Rayon atomique

PERIODIC TABLE OF ELEMENTS

<div>PubChem</div>																		<div>2He</div> <div>Helium</div> <div>1s²</div>							
<div>1H</div> <div>Hydrogen</div> <div>1s¹</div>		<div>1H</div> <div>Hydrogen</div> <div>1s¹</div>																		<div>Atomic Number</div> <div>Symbol</div> <div>Name</div> <div>Electron Configuration</div>					
<div>3Li</div> <div>Lithium</div> <div>[He]2s¹</div>	<div>4Be</div> <div>Beryllium</div> <div>[He]2s²</div>																			<div>5B</div> <div>Boron</div> <div>[He]2s²2p¹</div>	<div>6C</div> <div>Carbon</div> <div>[He]2s²2p²</div>	<div>7N</div> <div>Nitrogen</div> <div>[He]2s²2p³</div>	<div>8O</div> <div>Oxygen</div> <div>[He]2s²2p⁴</div>	<div>9F</div> <div>Fluorine</div> <div>[He]2s²2p⁵</div>	<div>10Ne</div> <div>Neon</div> <div>[He]2s²2p⁶</div>
<div>11Na</div> <div>Sodium</div> <div>[Ne]3s¹</div>	<div>12Mg</div> <div>Magnesium</div> <div>[Ne]3s²</div>																			<div>13Al</div> <div>Aluminum</div> <div>[Ne]3s²3p¹</div>	<div>14Si</div> <div>Silicon</div> <div>[Ne]3s²3p²</div>	<div>15P</div> <div>Phosphorus</div> <div>[Ne]3s²3p³</div>	<div>16S</div> <div>Sulfur</div> <div>[Ne]3s²3p⁴</div>	<div>17Cl</div> <div>Chlorine</div> <div>[Ne]3s²3p⁵</div>	<div>18Ar</div> <div>Argon</div> <div>[Ne]3s²3p⁶</div>
<div>19K</div> <div>Potassium</div> <div>[Ar]4s¹</div>	<div>20Ca</div> <div>Calcium</div> <div>[Ar]4s²</div>	<div>21Sc</div> <div>Scandium</div> <div>[Ar]3d¹4s²</div>	<div>22Ti</div> <div>Titanium</div> <div>[Ar]3d²4s²</div>	<div>23V</div> <div>Vanadium</div> <div>[Ar]3d³4s²</div>	<div>24Cr</div> <div>Chromium</div> <div>[Ar]3d⁵4s¹</div>	<div>25Mn</div> <div>Manganese</div> <div>[Ar]3d⁵4s²</div>	<div>26Fe</div> <div>Iron</div> <div>[Ar]3d⁶4s²</div>	<div>27Co</div> <div>Cobalt</div> <div>[Ar]3d⁷4s²</div>	<div>28Ni</div> <div>Nickel</div> <div>[Ar]3d⁸4s²</div>	<div>29Cu</div> <div>Copper</div> <div>[Ar]3d¹⁰4s¹</div>	<div>30Zn</div> <div>Zinc</div> <div>[Ar]3d¹⁰4s²</div>	<div>31Ga</div> <div>Gallium</div> <div>[Ar]3d¹⁰4s²4p¹</div>	<div>32Ge</div> <div>Germanium</div> <div>[Ar]3d¹⁰4s²4p²</div>	<div>33As</div> <div>Arsenic</div> <div>[Ar]3d¹⁰4s²4p³</div>	<div>34Se</div> <div>Selenium</div> <div>[Ar]3d¹⁰4s²4p⁴</div>	<div>35Br</div> <div>Bromine</div> <div>[Ar]3d¹⁰4s²4p⁵</div>	<div>36Kr</div> <div>Krypton</div> <div>[Ar]3d¹⁰4s²4p⁶</div>								
<div>37Rb</div> <div>Rubidium</div> <div>[Kr]5s¹</div>	<div>38Sr</div> <div>Strontium</div> <div>[Kr]5s²</div>	<div>39Y</div> <div>Yttrium</div> <div>[Kr]4d¹5s²</div>	<div>40Zr</div> <div>Zirconium</div> <div>[Kr]4d²5s²</div>	<div>41Nb</div> <div>Niobium</div> <div>[Kr]4d⁴5s¹</div>	<div>42Mo</div> <div>Molybdenum</div> <div>[Kr]4d⁵5s¹</div>	<div>43Tc</div> <div>Technetium</div> <div>[Kr]4d⁵5s²</div>	<div>44Ru</div> <div>Ruthenium</div> <div>[Kr]4d⁷5s¹</div>	<div>45Rh</div> <div>Rhodium</div> <div>[Kr]4d⁸5s¹</div>	<div>46Pd</div> <div>Palladium</div> <div>[Kr]4d¹⁰</div>	<div>47Ag</div> <div>Silver</div> <div>[Kr]4d¹⁰5s¹</div>	<div>48Cd</div> <div>Cadmium</div> <div>[Kr]4d¹⁰5s²</div>	<div>49In</div> <div>Indium</div> <div>[Kr]4d¹⁰5s²5p¹</div>	<div>50Sn</div> <div>Tin</div> <div>[Kr]4d¹⁰5s²5p²</div>	<div>51Sb</div> <div>Antimony</div> <div>[Kr]4d¹⁰5s²5p³</div>	<div>52Te</div> <div>Tellurium</div> <div>[Kr]4d¹⁰5s²5p⁴</div>	<div>53I</div> <div>Iodine</div> <div>[Kr]4d¹⁰5s²5p⁵</div>	<div>54Xe</div> <div>Xenon</div> <div>[Kr]4d¹⁰5s²5p⁶</div>								
<div>55Cs</div> <div>Cesium</div> <div>[Xe]6s¹</div>	<div>56Ba</div> <div>Barium</div> <div>[Xe]6s²</div>	·	<div>72Hf</div> <div>Hafnium</div> <div>[Xe]4f¹⁴5d²6s²</div>	<div>73Ta</div> <div>Tantalum</div> <div>[Xe]4f¹⁴5d³6s²</div>	<div>74W</div> <div>Tungsten</div> <div>[Xe]4f¹⁴5d⁴6s²</div>	<div>75Re</div> <div>Rhenium</div> <div>[Xe]4f¹⁴5d⁵6s²</div>	<div>76Os</div> <div>Osmium</div> <div>[Xe]4f¹⁴5d⁶6s²</div>	<div>77Ir</div> <div>Iridium</div> <div>[Xe]4f¹⁴5d⁷6s²</div>	<div>78Pt</div> <div>Platinum</div> <div>[Xe]4f¹⁴5d⁹6s¹</div>	<div>79Au</div> <div>Gold</div> <div>[Xe]4f¹⁴5d¹⁰6s¹</div>	<div>80Hg</div> <div>Mercury</div> <div>[Xe]4f¹⁴5d¹⁰6s²</div>	<div>81Tl</div> <div>Thallium</div> <div>[Xe]4f¹⁴5d¹⁰6s²6p¹</div>	<div>82Pb</div> <div>Lead</div> <div>[Xe]4f¹⁴5d¹⁰6s²6p²</div>	<div>83Bi</div> <div>Bismuth</div> <div>[Xe]4f¹⁴5d¹⁰6s²6p³</div>	<div>84Po</div> <div>Polonium</div> <div>[Xe]4f¹⁴5d¹⁰6s²6p⁴</div>	<div>85At</div> <div>Astatine</div> <div>[Xe]4f¹⁴5d¹⁰6s²6p⁵</div>	<div>86Rn</div> <div>Radon</div> <div>[Xe]4f¹⁴5d¹⁰6s²6p⁶</div>								
<div>87Fr</div> <div>Francium</div> <div>[Rn]7s¹</div>	<div>88Ra</div> <div>Radium</div> <div>[Rn]7s²</div>	·	<div>104Rf</div> <div>Rutherfordium</div> <div>[Rn]5f¹⁴6d²7s²</div>	<div>105Db</div> <div>Dubnium</div> <div>[Rn]5f¹⁴6d³7s²</div>	<div>106Sg</div> <div>Seaborgium</div> <div>[Rn]5f¹⁴6d⁴7s²</div>	<div>107Bh</div> <div>Bohrium</div> <div>[Rn]5f¹⁴6d⁵7s²</div>	<div>108Hs</div> <div>Hassium</div> <div>[Rn]5f¹⁴6d⁶7s²</div>	<div>109Mt</div> <div>Meitnerium</div> <div>[Rn]5f¹⁴6d⁷7s²</div>	<div>110Ds</div> <div>Darmstadtium</div> <div>[Rn]5f¹⁴6d⁸7s²</div>	<div>111Rg</div> <div>Roentgenium</div> <div>[Rn]5f¹⁴6d⁹7s²</div>	<div>112Cn</div> <div>Copernicium</div> <div>[Rn]5f¹⁴6d¹⁰7s²</div>	<div>113Nh</div> <div>Nihonium</div> <div>[Rn]5f¹⁴6d¹⁰7s²7p¹</div>	<div>114Fl</div> <div>Flerovium</div> <div>[Rn]5f¹⁴6d¹⁰7s²7p²</div>	<div>115Mc</div> <div>Moscovium</div> <div>[Rn]5f¹⁴6d¹⁰7s²7p³</div>	<div>116Lv</div> <div>Livermorium</div> <div>[Rn]5f¹⁴6d¹⁰7s²7p⁴</div>	<div>117Ts</div> <div>Tennessine</div> <div>[Rn]5f¹⁴6d¹⁰7s²7p⁵</div>	<div>118Og</div> <div>Oganesson</div> <div>[Rn]5f¹⁴6d¹⁰7s²7p⁶</div>								
		·	<div>57La</div> <div>Lanthanum</div> <div>[Xe]5d¹6s²</div>	<div>58Ce</div> <div>Cerium</div> <div>[Xe]4f¹5d¹6s²</div>	<div>59Pr</div> <div>Praseodymium</div> <div>[Xe]4f³6s²</div>	<div>60Nd</div> <div>Neodymium</div> <div>[Xe]4f⁴6s²</div>	<div>61Pm</div> <div>Promethium</div> <div>[Xe]4f⁵6s²</div>	<div>62Sm</div> <div>Samarium</div> <div>[Xe]4f⁶6s²</div>	<div>63Eu</div> <div>Europium</div> <div>[Xe]4f⁷6s²</div>	<div>64Gd</div> <div>Gadolinium</div> <div>[Xe]4f⁷5d¹6s²</div>	<div>65Tb</div> <div>Terbium</div> <div>[Xe]4f⁹6s²</div>	<div>66Dy</div> <div>Dysprosium</div> <div>[Xe]4f¹⁰6s²</div>	<div>67Ho</div> <div>Holmium</div> <div>[Xe]4f¹¹6s²</div>	<div>68Er</div> <div>Erbium</div> <div>[Xe]4f¹²6s²</div>	<div>69Tm</div> <div>Thulium</div> <div>[Xe]4f¹³6s²</div>	<div>70Yb</div> <div>Ytterbium</div> <div>[Xe]4f¹⁴6s²</div>	<div>71Lu</div> <div>Lutetium</div> <div>[Xe]4f¹⁴5d¹6s²</div>								
		·	<div>89Ac</div> <div>Actinium</div> <div>[Rn]6d¹7s²</div>	<div>90Th</div> <div>Thorium</div> <div>[Rn]6d²7s²</div>	<div>91Pa</div> <div>Protactinium</div> <div>[Rn]5f²6d¹7s²</div>	<div>92U</div> <div>Uranium</div> <div>[Rn]5f³6d¹7s²</div>	<div>93Np</div> <div>Neptunium</div> <div>[Rn]5f⁴6d¹7s²</div>	<div>94Pu</div> <div>Plutonium</div> <div>[Rn]5f⁶7s²</div>	<div>95Am</div> <div>Americium</div> <div>[Rn]5f⁷7s²</div>	<div>96Cm</div> <div>Curium</div> <div>[Rn]5f⁸7s²</div>	<div>97Bk</div> <div>Berkelium</div> <div>[Rn]5f⁹7s²</div>	<div>98Cf</div> <div>Californium</div> <div>[Rn]5f¹⁰7s²</div>	<div>99Es</div> <div>Einsteinium</div> <div>[Rn]5f¹¹7s²</div>	<div>100Fm</div> <div>Fermium</div> <div>[Rn]5f¹²7s²</div>	<div>101Md</div> <div>Mendelevium</div> <div>[Rn]5f¹³7s²</div>	<div>102No</div> <div>Nobelium</div> <div>[Rn]5f¹⁴7s²</div>	<div>103Lr</div> <div>Lawrencium</div> <div>[Rn]5f¹⁴6d¹7s²</div>								

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Rayon atomique

PERIODIC TABLE OF ELEMENTS

1

H

Hydrogen

1

H

Hydrogen

1s¹

Atomic Number

Symbol

Name

Electron Configuration

Pub

Chem

3	4																	5	6	7	8	9	10									
Li	Be																	B	C	N	O	F	Ne									
Lithium	Beryllium																	Boron	Carbon	Nitrogen	Oxygen	Fluorine	Neon									
11	12																	13	14	15	16	17	18									
Na	Mg																	Al	Si	P	S	Cl	Ar									
Sodium	Magnesium																	Aluminum	Silicon	Phosphorus	Sulfur	Chlorine	Argon									
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36															
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr															
Potassium	Calcium	Scandium	Titanium	Vanadium	Chromium	Manganese	Iron	Cobalt	Nickel	Copper	Zinc	Gallium	Germanium	Arsenic	Selenium	Bromine	Krypton															
37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54															
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe															
Rubidium	Strontium	Yttrium	Zirconium	Niobium	Molybdenum	Technetium	Ruthenium	Rhodium	Palladium	Silver	Cadmium	Indium	Tin	Antimony	Tellurium	Iodine	Xenon															
55	56																	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
Cs	Ba																	La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
Cesium	Barium																	Lanthanum	Cerium	Praseodymium	Neodymium	Promethium	Samarium	Europium	Gadolinium	Terbium	Dysprosium	Holmium	Erbium	Thulium	Ytterbium	Lutetium
87	88																	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103
Fr	Ra																	Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr
Francium	Radium																	Actinium	Thorium	Protactinium	Uranium	Neptunium	Plutonium	Americium	Curium	Berkelium	Californium	Einsteinium	Fermium	Mendelevium	Nobelium	Lawrencium

Rayon atomique augmente

<https://pubchem.ncbi.nlm.nih.gov/periodic-table/#view=table&property=ElectronConfiguration>

Propriétés d'oxydo-réduction

PERIODIC TABLE OF ELEMENTS

<div>PubChem</div>																		<div>2</div> <div>He</div> <div>Helium</div> <div>$1s^2$</div>							
<div>1</div> <div>H</div> <div>Hydrogen</div> <div>$1s^1$</div>		<div>1</div> <div>H</div> <div>Hydrogen</div> <div>$1s^1$</div>																		<div>Atomic Number</div> <div>Symbol</div> <div>Name</div> <div>Electron Configuration</div>					
<div>3</div> <div>Li</div> <div>Lithium</div> <div>$[He]2s^1$</div>	<div>4</div> <div>Be</div> <div>Beryllium</div> <div>$[He]2s^2$</div>																			<div>5</div> <div>B</div> <div>Boron</div> <div>$[He]2s^2 2p^1$</div>	<div>6</div> <div>C</div> <div>Carbon</div> <div>$[He]2s^2 2p^2$</div>	<div>7</div> <div>N</div> <div>Nitrogen</div> <div>$[He]2s^2 2p^3$</div>	<div>8</div> <div>O</div> <div>Oxygen</div> <div>$[He]2s^2 2p^4$</div>	<div>9</div> <div>F</div> <div>Fluorine</div> <div>$[He]2s^2 2p^5$</div>	<div>10</div> <div>Ne</div> <div>Neon</div> <div>$[He]2s^2 2p^6$</div>
<div>11</div> <div>Na</div> <div>Sodium</div> <div>$[Ne]3s^1$</div>	<div>12</div> <div>Mg</div> <div>Magnesium</div> <div>$[Ne]3s^2$</div>																			<div>13</div> <div>Al</div> <div>Aluminum</div> <div>$[Ne]3s^2 3p^1$</div>	<div>14</div> <div>Si</div> <div>Silicon</div> <div>$[Ne]3s^2 3p^2$</div>	<div>15</div> <div>P</div> <div>Phosphorus</div> <div>$[Ne]3s^2 3p^3$</div>	<div>16</div> <div>S</div> <div>Sulfur</div> <div>$[Ne]3s^2 3p^4$</div>	<div>17</div> <div>Cl</div> <div>Chlorine</div> <div>$[Ne]3s^2 3p^5$</div>	<div>18</div> <div>Ar</div> <div>Argon</div> <div>$[Ne]3s^2 3p^6$</div>
<div>19</div> <div>K</div> <div>Potassium</div> <div>$[Ar]4s^1$</div>	<div>20</div> <div>Ca</div> <div>Calcium</div> <div>$[Ar]4s^2$</div>	<div>21</div> <div>Sc</div> <div>Scandium</div> <div>$[Ar]3d^1 4s^2$</div>	<div>22</div> <div>Ti</div> <div>Titanium</div> <div>$[Ar]3d^2 4s^2$</div>	<div>23</div> <div>V</div> <div>Vanadium</div> <div>$[Ar]3d^3 4s^2$</div>	<div>24</div> <div>Cr</div> <div>Chromium</div> <div>$[Ar]3d^5 4s^1$</div>	<div>25</div> <div>Mn</div> <div>Manganese</div> <div>$[Ar]3d^5 4s^2$</div>	<div>26</div> <div>Fe</div> <div>Iron</div> <div>$[Ar]3d^6 4s^2$</div>	<div>27</div> <div>Co</div> <div>Cobalt</div> <div>$[Ar]3d^7 4s^2$</div>	<div>28</div> <div>Ni</div> <div>Nickel</div> <div>$[Ar]3d^8 4s^2$</div>	<div>29</div> <div>Cu</div> <div>Copper</div> <div>$[Ar]3d^{10} 4s^1$</div>	<div>30</div> <div>Zn</div> <div>Zinc</div> <div>$[Ar]3d^{10} 4s^2$</div>	<div>31</div> <div>Ga</div> <div>Gallium</div> <div>$[Ar]3d^{10} 4s^2 4p^1$</div>	<div>32</div> <div>Ge</div> <div>Germanium</div> <div>$[Ar]3d^{10} 4s^2 4p^2$</div>	<div>33</div> <div>As</div> <div>Arsenic</div> <div>$[Ar]3d^{10} 4s^2 4p^3$</div>	<div>34</div> <div>Se</div> <div>Selenium</div> <div>$[Ar]3d^{10} 4s^2 4p^4$</div>	<div>35</div> <div>Br</div> <div>Bromine</div> <div>$[Ar]3d^{10} 4s^2 4p^5$</div>	<div>36</div> <div>Kr</div> <div>Krypton</div> <div>$[Ar]3d^{10} 4s^2 4p^6$</div>								
<div>37</div> <div>Rb</div> <div>Rubidium</div> <div>$[Kr]5s^1$</div>	<div>38</div> <div>Sr</div> <div>Strontium</div> <div>$[Kr]5s^2$</div>	<div>39</div> <div>Y</div> <div>Yttrium</div> <div>$[Kr]4d^1 5s^2$</div>	<div>40</div> <div>Zr</div> <div>Zirconium</div> <div>$[Kr]4d^2 5s^2$</div>	<div>41</div> <div>Nb</div> <div>Niobium</div> <div>$[Kr]4d^4 5s^1$</div>	<div>42</div> <div>Mo</div> <div>Molybdenum</div> <div>$[Kr]4d^5 5s^1$</div>	<div>43</div> <div>Tc</div> <div>Technetium</div> <div>$[Kr]4d^5 5s^2$</div>	<div>44</div> <div>Ru</div> <div>Ruthenium</div> <div>$[Kr]4d^7 5s^1$</div>	<div>45</div> <div>Rh</div> <div>Rhodium</div> <div>$[Kr]4d^8 5s^1$</div>	<div>46</div> <div>Pd</div> <div>Palladium</div> <div>$[Kr]4d^{10}$</div>	<div>47</div> <div>Ag</div> <div>Silver</div> <div>$[Kr]4d^{10} 5s^1$</div>	<div>48</div> <div>Cd</div> <div>Cadmium</div> <div>$[Kr]4d^{10} 5s^2$</div>	<div>49</div> <div>In</div> <div>Indium</div> <div>$[Kr]4d^{10} 5s^2 5p^1$</div>	<div>50</div> <div>Sn</div> <div>Tin</div> <div>$[Kr]4d^{10} 5s^2 5p^2$</div>	<div>51</div> <div>Sb</div> <div>Antimony</div> <div>$[Kr]4d^{10} 5s^2 5p^3$</div>	<div>52</div> <div>Te</div> <div>Tellurium</div> <div>$[Kr]4d^{10} 5s^2 5p^4$</div>	<div>53</div> <div>I</div> <div>Iodine</div> <div>$[Kr]4d^{10} 5s^2 5p^5$</div>	<div>54</div> <div>Xe</div> <div>Xenon</div> <div>$[Kr]4d^{10} 5s^2 5p^6$</div>								
<div>55</div> <div>Cs</div> <div>Cesium</div> <div>$[Xe]6s^1$</div>	<div>56</div> <div>Ba</div> <div>Barium</div> <div>$[Xe]6s^2$</div>	•	<div>72</div> <div>Hf</div> <div>Hafnium</div> <div>$[Xe]4f^{14} 5d^2 6s^2$</div>	<div>73</div> <div>Ta</div> <div>Tantalum</div> <div>$[Xe]4f^{14} 5d^3 6s^2$</div>	<div>74</div> <div>W</div> <div>Tungsten</div> <div>$[Xe]4f^{14} 5d^4 6s^2$</div>	<div>75</div> <div>Re</div> <div>Rhenium</div> <div>$[Xe]4f^{14} 5d^5 6s^2$</div>	<div>76</div> <div>Os</div> <div>Osmium</div> <div>$[Xe]4f^{14} 5d^6 6s^2$</div>	<div>77</div> <div>Ir</div> <div>Iridium</div> <div>$[Xe]4f^{14} 5d^7 6s^2$</div>	<div>78</div> <div>Pt</div> <div>Platinum</div> <div>$[Xe]4f^{14} 5d^9 6s^1$</div>	<div>79</div> <div>Au</div> <div>Gold</div> <div>$[Xe]4f^{14} 5d^{10} 6s^1$</div>	<div>80</div> <div>Hg</div> <div>Mercury</div> <div>$[Xe]4f^{14} 5d^{10} 6s^2$</div>	<div>81</div> <div>Tl</div> <div>Thallium</div> <div>$[Xe]4f^{14} 5d^{10} 6s^2 6p^1$</div>	<div>82</div> <div>Pb</div> <div>Lead</div> <div>$[Xe]4f^{14} 5d^{10} 6s^2 6p^2$</div>	<div>83</div> <div>Bi</div> <div>Bismuth</div> <div>$[Xe]4f^{14} 5d^{10} 6s^2 6p^3$</div>	<div>84</div> <div>Po</div> <div>Polonium</div> <div>$[Xe]4f^{14} 5d^{10} 6s^2 6p^4$</div>	<div>85</div> <div>At</div> <div>Astatine</div> <div>$[Xe]4f^{14} 5d^{10} 6s^2 6p^5$</div>	<div>86</div> <div>Rn</div> <div>Radon</div> <div>$[Xe]4f^{14} 5d^{10} 6s^2 6p^6$</div>								
<div>87</div> <div>Fr</div> <div>Francium</div> <div>$[Rn]7s^1$</div>	<div>88</div> <div>Ra</div> <div>Radium</div> <div>$[Rn]7s^2$</div>	••	<div>104</div> <div>Rf</div> <div>Rutherfordium</div> <div>$[Rn]5f^{14} 6d^2 7s^2$</div>	<div>105</div> <div>Db</div> <div>Dubnium</div> <div>$[Rn]5f^{14} 6d^3 7s^2$</div>	<div>106</div> <div>Sg</div> <div>Seaborgium</div> <div>$[Rn]5f^{14} 6d^4 7s^2$</div>	<div>107</div> <div>Bh</div> <div>Bohrium</div> <div>$[Rn]5f^{14} 6d^5 7s^2$</div>	<div>108</div> <div>Hs</div> <div>Hassium</div> <div>$[Rn]5f^{14} 6d^6 7s^2$</div>	<div>109</div> <div>Mt</div> <div>Meitnerium</div> <div>$[Rn]5f^{14} 6d^7 7s^2$</div>	<div>110</div> <div>Ds</div> <div>Darmstadtium</div> <div>$[Rn]5f^{14} 6d^8 7s^2$</div>	<div>111</div> <div>Rg</div> <div>Roentgenium</div> <div>$[Rn]5f^{14} 6d^9 7s^2$</div>	<div>112</div> <div>Cn</div> <div>Copernicium</div> <div>$[Rn]5f^{14} 6d^{10} 7s^2$</div>	<div>113</div> <div>Nh</div> <div>Nihonium</div> <div>$[Rn]5f^{14} 6d^{10} 7s^2 7p^1$</div>	<div>114</div> <div>Fl</div> <div>Flerovium</div> <div>$[Rn]5f^{14} 6d^{10} 7s^2 7p^2$</div>	<div>115</div> <div>Mc</div> <div>Moscovium</div> <div>$[Rn]5f^{14} 6d^{10} 7s^2 7p^3$</div>	<div>116</div> <div>Lv</div> <div>Livermorium</div> <div>$[Rn]5f^{14} 6d^{10} 7s^2 7p^4$</div>	<div>117</div> <div>Ts</div> <div>Tennessine</div> <div>$[Rn]5f^{14} 6d^{10} 7s^2 7p^5$</div>	<div>118</div> <div>Og</div> <div>Oganesson</div> <div>$[Rn]5f^{14} 6d^{10} 7s^2 7p^6$</div>								
•		<div>57</div> <div>La</div> <div>Lanthanum</div> <div>$[Xe]5d^1 6s^2$</div>	<div>58</div> <div>Ce</div> <div>Cerium</div> <div>$[Xe]4f^1 5d^1 6s^2$</div>	<div>59</div> <div>Pr</div> <div>Praseodymium</div> <div>$[Xe]4f^3 6s^2$</div>	<div>60</div> <div>Nd</div> <div>Neodymium</div> <div>$[Xe]4f^4 6s^2$</div>	<div>61</div> <div>Pm</div> <div>Promethium</div> <div>$[Xe]4f^5 6s^2$</div>	<div>62</div> <div>Sm</div> <div>Samarium</div> <div>$[Xe]4f^6 6s^2$</div>	<div>63</div> <div>Eu</div> <div>Europium</div> <div>$[Xe]4f^7 6s^2$</div>	<div>64</div> <div>Gd</div> <div>Gadolinium</div> <div>$[Xe]4f^7 5d^1 6s^2$</div>	<div>65</div> <div>Tb</div> <div>Terbium</div> <div>$[Xe]4f^9 6s^2$</div>	<div>66</div> <div>Dy</div> <div>Dysprosium</div> <div>$[Xe]4f^{10} 6s^2$</div>	<div>67</div> <div>Ho</div> <div>Holmium</div> <div>$[Xe]4f^{11} 6s^2$</div>	<div>68</div> <div>Er</div> <div>Erbium</div> <div>$[Xe]4f^{12} 6s^2$</div>	<div>69</div> <div>Tm</div> <div>Thulium</div> <div>$[Xe]4f^{13} 6s^2$</div>	<div>70</div> <div>Yb</div> <div>Ytterbium</div> <div>$[Xe]4f^{14} 6s^2$</div>	<div>71</div> <div>Lu</div> <div>Lutetium</div> <div>$[Xe]4f^{14} 5d^1 6s^2$</div>									
••		<div>89</div> <div>Ac</div> <div>Actinium</div> <div>$[Rn]6d^1 7s^2$</div>	<div>90</div> <div>Th</div> <div>Thorium</div> <div>$[Rn]6d^2 7s^2$</div>	<div>91</div> <div>Pa</div> <div>Protactinium</div> <div>$[Rn]5f^2 6d^1 7s^2$</div>	<div>92</div> <div>U</div> <div>Uranium</div> <div>$[Rn]5f^3 6d^1 7s^2$</div>	<div>93</div> <div>Np</div> <div>Neptunium</div> <div>$[Rn]5f^4 6d^1 7s^2$</div>	<div>94</div> <div>Pu</div> <div>Plutonium</div> <div>$[Rn]5f^6 7s^2$</div>	<div>95</div> <div>Am</div> <div>Americium</div> <div>$[Rn]5f^7 7s^2$</div>	<div>96</div> <div>Cm</div> <div>Curium</div> <div>$[Rn]5f^8 7s^2$</div>	<div>97</div> <div>Bk</div> <div>Berkelium</div> <div>$[Rn]5f^9 7s^2$</div>	<div>98</div> <div>Cf</div> <div>Californium</div> <div>$[Rn]5f^{10} 7s^2$</div>	<div>99</div> <div>Es</div> <div>Einsteinium</div> <div>$[Rn]5f^{11} 7s^2$</div>	<div>100</div> <div>Fm</div> <div>Fermium</div> <div>$[Rn]5f^{12} 7s^2$</div>	<div>101</div> <div>Md</div> <div>Mendelevium</div> <div>$[Rn]5f^{13} 7s^2$</div>	<div>102</div> <div>No</div> <div>Nobelium</div> <div>$[Rn]5f^{14} 7s^2$</div>	<div>103</div> <div>Lr</div> <div>Lawrencium</div> <div>$[Rn]5f^{14} 6d^1 7s^2$</div>									

<https://pubchem.ncbi.nlm.nih.gov/periodic-table/#view=table&property=ElectronConfiguration>

Propriétés d'oxydo-réduction

PERIODIC TABLE OF ELEMENTS

1

H

Hydrogen

¹₁H

3

Li

Lithium

³₃Li

11

Na

Sodium

¹¹₁₁Na

19

K

Potassium

¹⁹₁₉K

37

Rb

Rubidium

³⁷₃₇Rb

55

Cs

Cesium

⁵⁵₅₅Cs

87

Fr

Francium

⁸⁷₈₇Fr

4

Be

Beryllium

⁴₄Be

12

Mg

Magnesium

¹²₁₂Mg

20

Ca

Calcium

²⁰₂₀Ca

38

Sr

Strontium

³⁸₃₈Sr

56

Ba

Barium

⁵⁶₅₆Ba

88

Ra

Radium

⁸⁸₈₈Ra

2

He

Helium

²₂He

10

Ne

Neon

¹⁰₁₀Ne

18

Ar

Argon

¹⁸₁₈Ar

36

Kr

Krypton

³⁶₃₆Kr

54

Xe

Xenon

⁵⁴₅₄Xe

86

Rn

Radon

⁸⁶₈₆Rn

2

He

Helium

²₂He

10

Ne

Neon

¹⁰₁₀Ne

18

Ar

Argon

¹⁸₁₈Ar

36

Kr

Krypton

³⁶₃₆Kr

54

Xe

Xenon

⁵⁴₅₄Xe

86

Rn

Radon

⁸⁶₈₆Rn

1

H

Hydrogen

¹₁H

3

Li

Lithium

³₃Li

11

Na

Sodium

¹¹₁₁Na

19

K

Potassium

¹⁹₁₉K

37

Rb

Rubidium

³⁷₃₇Rb

55

Cs

Cesium

⁵⁵₅₅Cs

87

Fr

Francium

⁸⁷₈₇Fr

4

Be

Beryllium

⁴₄Be

12

Mg

Magnesium

¹²₁₂Mg

20

Ca

Calcium

²⁰₂₀Ca

38

Sr

Strontium

³⁸₃₈Sr

56

Ba

Barium

⁵⁶₅₆Ba

88

Ra

Radium

⁸⁸₈₈Ra

2

He

Helium

²₂He

10

Ne

Neon

¹⁰₁₀Ne

18

Ar

Argon

¹⁸₁₈Ar

36

Kr

Krypton

³⁶₃₆Kr

54

Xe

Xenon

⁵⁴₅₄Xe

86

Rn

Radon

⁸⁶₈₆Rn

2

He

Helium

²₂He

10

Ne

Neon

¹⁰₁₀Ne

18

Ar

Argon

¹⁸₁₈Ar

36

Kr

Krypton

³⁶₃₆Kr

54

Xe

Xenon

⁵⁴₅₄Xe

86

Rn

Radon

⁸⁶₈₆Rn

1

H

Hydrogen

¹₁H

3

Li

Lithium

³₃Li

11

Na

Sodium

¹¹₁₁Na

19

K

Potassium

¹⁹₁₉K

37

Rb

Rubidium

³⁷₃₇Rb

55

Cs

Cesium

⁵⁵₅₅Cs

87

Fr

Francium

⁸⁷₈₇Fr

4

Be

Beryllium

⁴₄Be

12

Mg

Magnesium

¹²₁₂Mg

20

Ca

Calcium

²⁰₂₀Ca

38

Sr

Strontium

³⁸₃₈Sr

56

Ba

Barium

⁵⁶₅₆Ba

88

Ra

Radium

⁸⁸₈₈Ra

2

He

Helium

²₂He

10

Ne

Neon

¹⁰₁₀Ne

18

Ar

Argon

¹⁸₁₈Ar

36

Kr

Krypton

³⁶₃₆Kr

54

Xe

Xenon

⁵⁴₅₄Xe

86

Rn

Radon

⁸⁶₈₆Rn

2

He

Helium

²₂He

10

Ne

Neon

¹⁰₁₀Ne

18

Ar

Argon

¹⁸₁₈Ar

36

Kr

Krypton

³⁶₃₆Kr

54

Xe

Xenon

⁵⁴₅₄Xe

86

Rn

Radon

⁸⁶₈₆Rn

1

H

Hydrogen

¹₁H

3

Li

Lithium

³₃Li

11

Na

Sodium

¹¹₁₁Na

19

K

Potassium

¹⁹₁₉K

37

Rb

Rubidium

³⁷₃₇Rb

55

Cs

Cesium

⁵⁵₅₅Cs

87

Fr

Francium

⁸⁷₈₇Fr

4

Be

Beryllium

⁴₄Be

12

Mg

Magnesium

¹²₁₂Mg

20

Ca

Calcium

²⁰₂₀Ca

38

Sr

Strontium

³⁸₃₈Sr

56

Ba

Barium

⁵⁶₅₆Ba

88

Ra

Radium

⁸⁸₈₈Ra

2

He

Helium

²₂He

10

Ne

Neon

¹⁰₁₀Ne

18

Ar

Argon

¹⁸₁₈Ar

36

Kr

Krypton

³⁶₃₆Kr

54

Xe

Xenon

⁵⁴₅₄Xe

86

Rn

Radon

⁸⁶₈₆Rn

2

He

Helium

²₂He

10

Ne

Neon

¹⁰₁₀Ne

18

Ar

Argon

¹⁸₁₈Ar

36

Kr

Krypton

³⁶₃₆Kr

54

Xe

Xenon

⁵⁴₅₄Xe

86

Rn

Radon

⁸⁶₈₆Rn

1

H

Hydrogen

¹₁H

3

Li

Lithium

³₃Li

11

Na

Sodium

¹¹₁₁Na

19

K

Potassium

¹⁹₁₉K

37

Rb

Rubidium

³⁷₃₇Rb

55

Cs

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⁵⁵₅₅Cs

87

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³⁶₃₆Kr

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Xe

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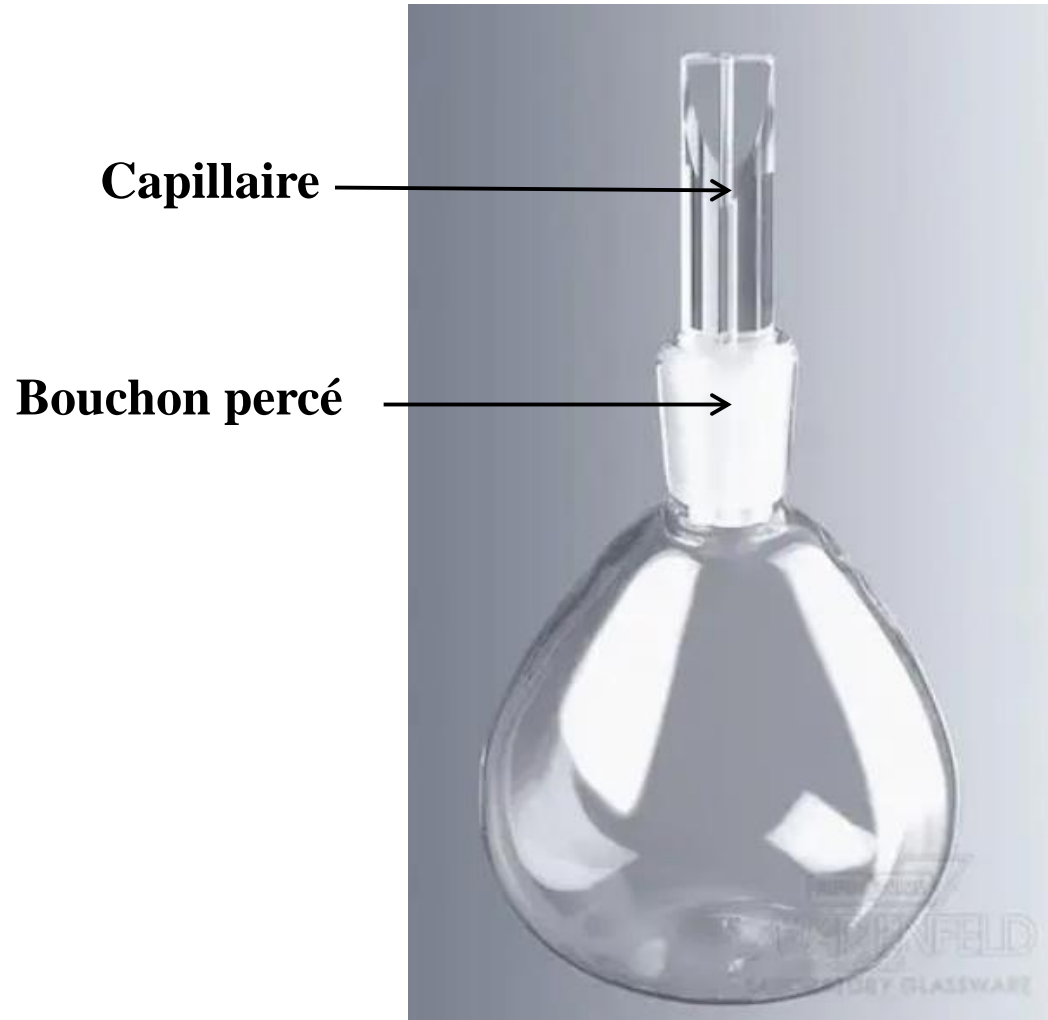
¹⁹

Bons réducteurs

Bons oxydants

<https://pubchem.ncbi.nlm.nih.gov/periodic-table/#view=table&property=ElectronConfiguration>

Détermination de longueur de liaison

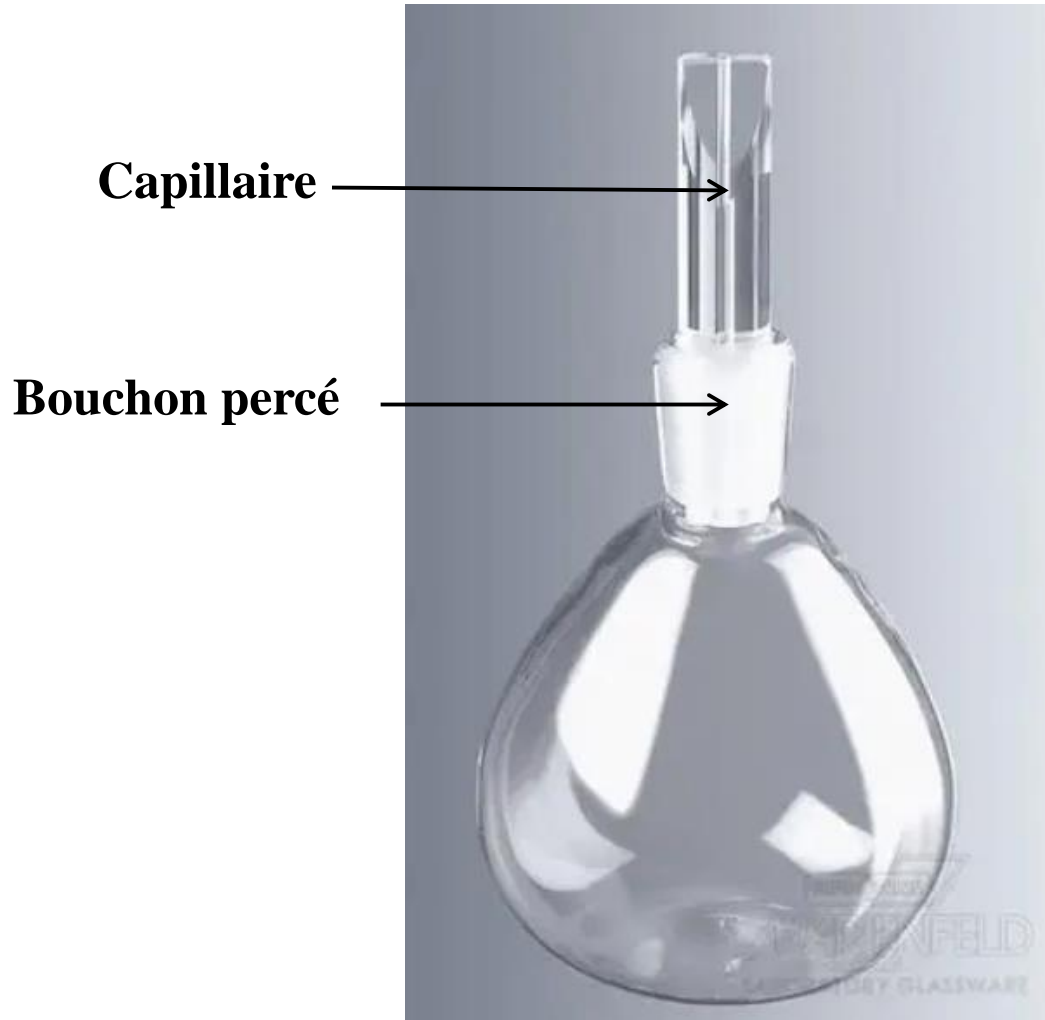


- On pèse le pycnomètre à vide : m_{pyc}
- On pèse le pycnomètre rempli de cyclohexane : $m_{pyc+cyclo}$

$$\rho_{cyclo} = \frac{m_{pyc+cyclo} - m_{pyc}}{V_{pyc}}$$

$$\rho_{cyclo}^{exp} =$$

Détermination de longueur de liaison

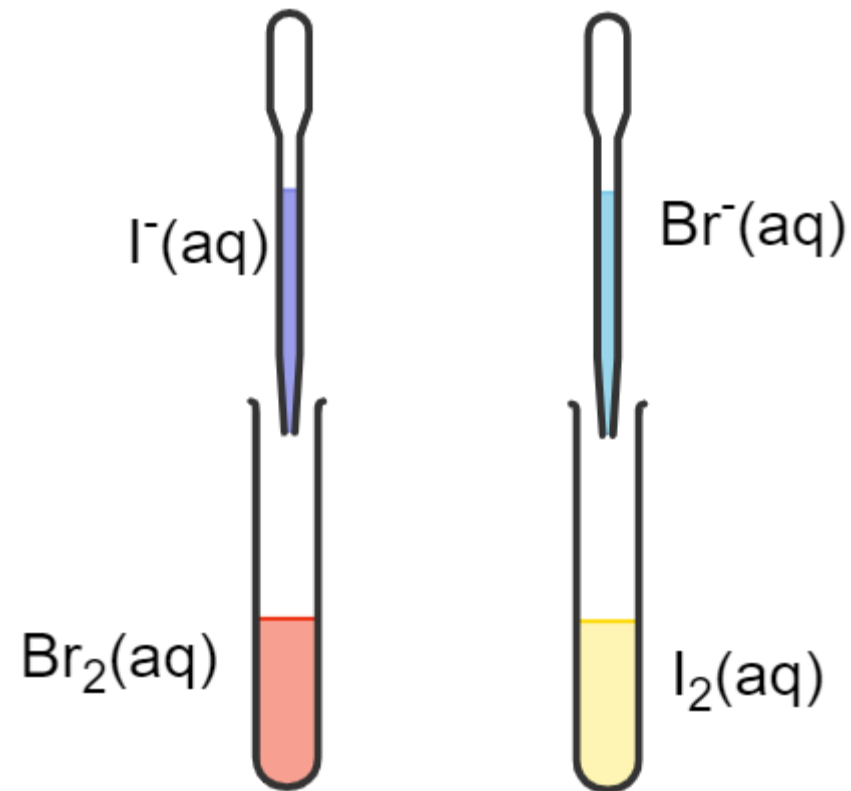


- On met une masse m de solide
- On remplit de cyclohexane
- On pèse à nouveau

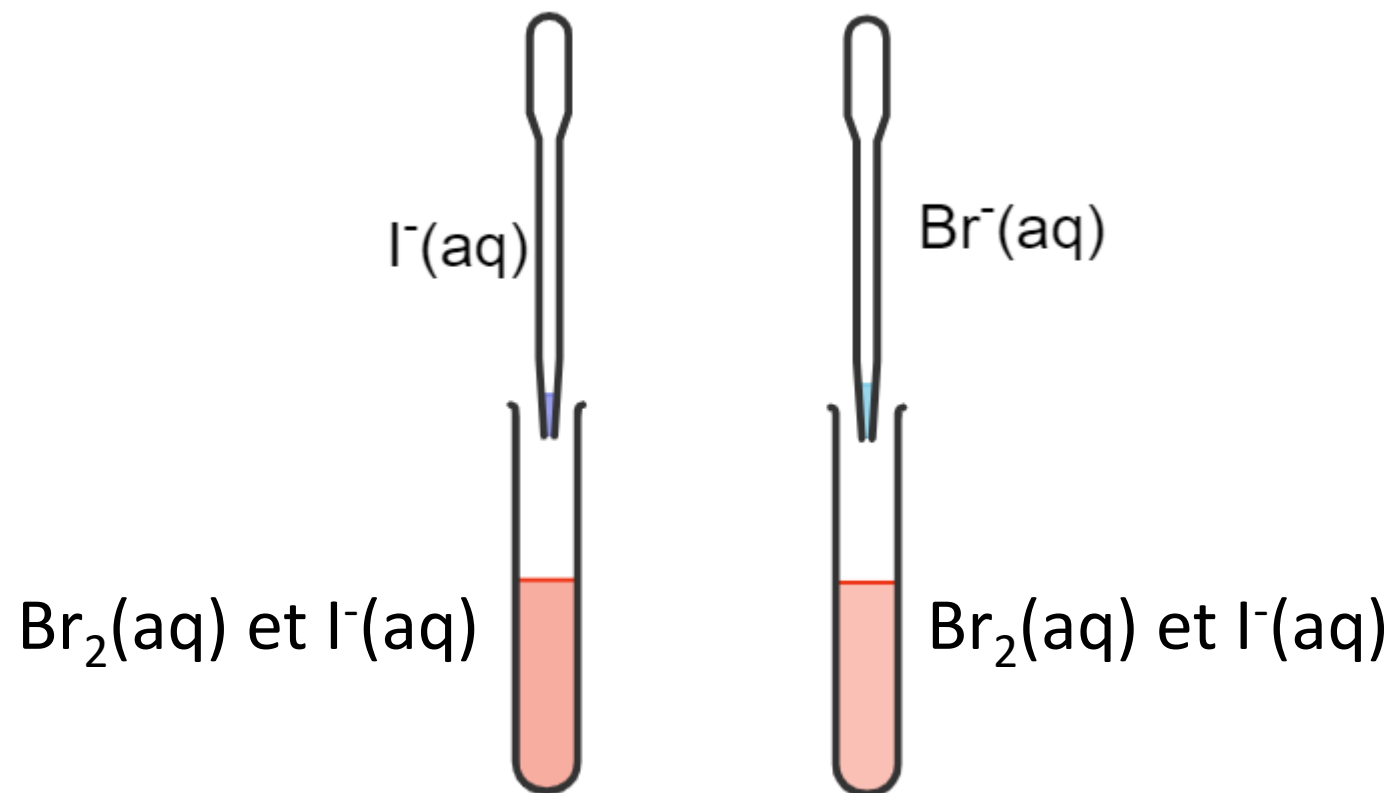
$$\rho = \frac{m\rho_{cyclo}}{(m_{tot} - m - m_{pyc})}$$

$$a = \left(\frac{4M_{solide}}{N_a\rho} \right)^{\frac{1}{3}}$$

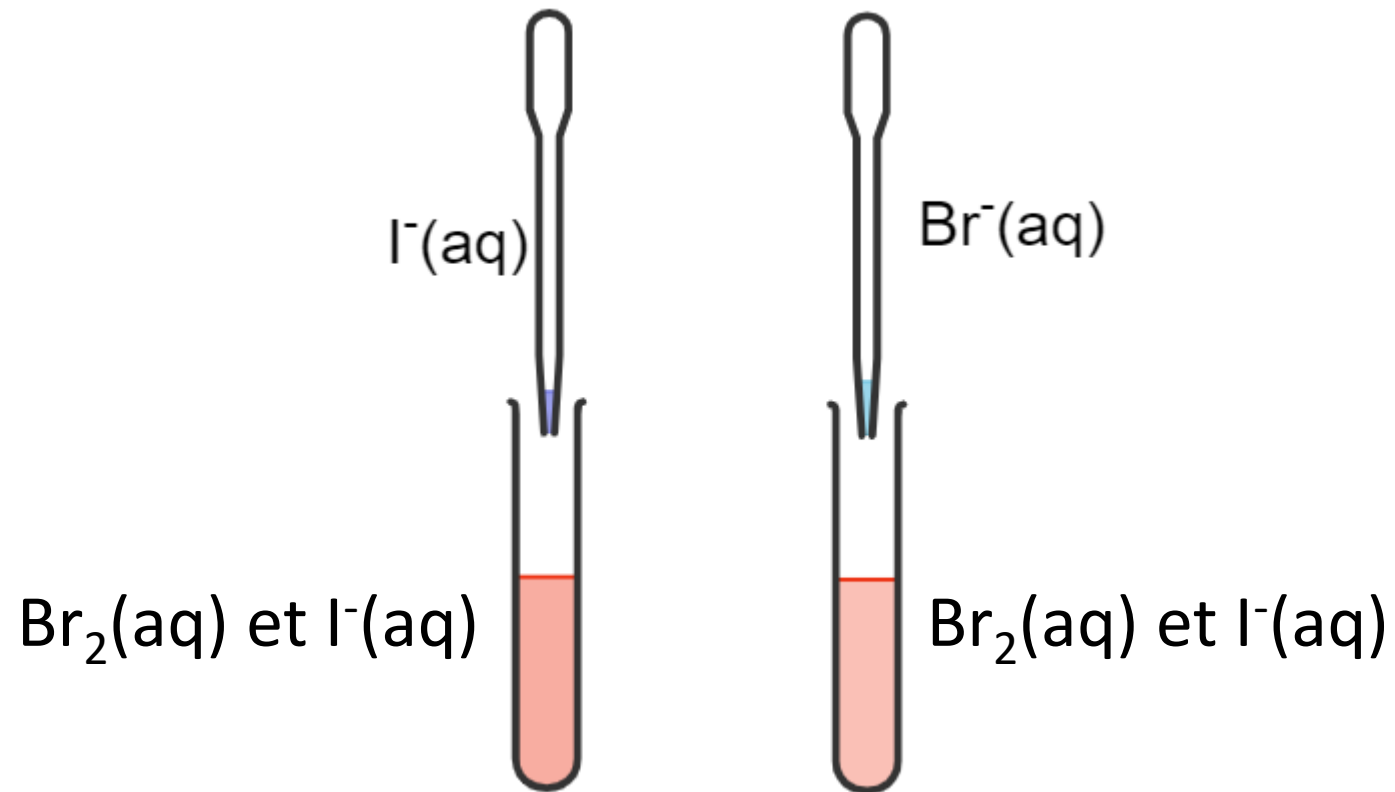
Pouvoir oxydant des halogènes



Pouvoir oxydant des halogènes



Pouvoir oxydant des halogènes



Le brome oxyde le diiode

Annexe : Arsenic et phosphore

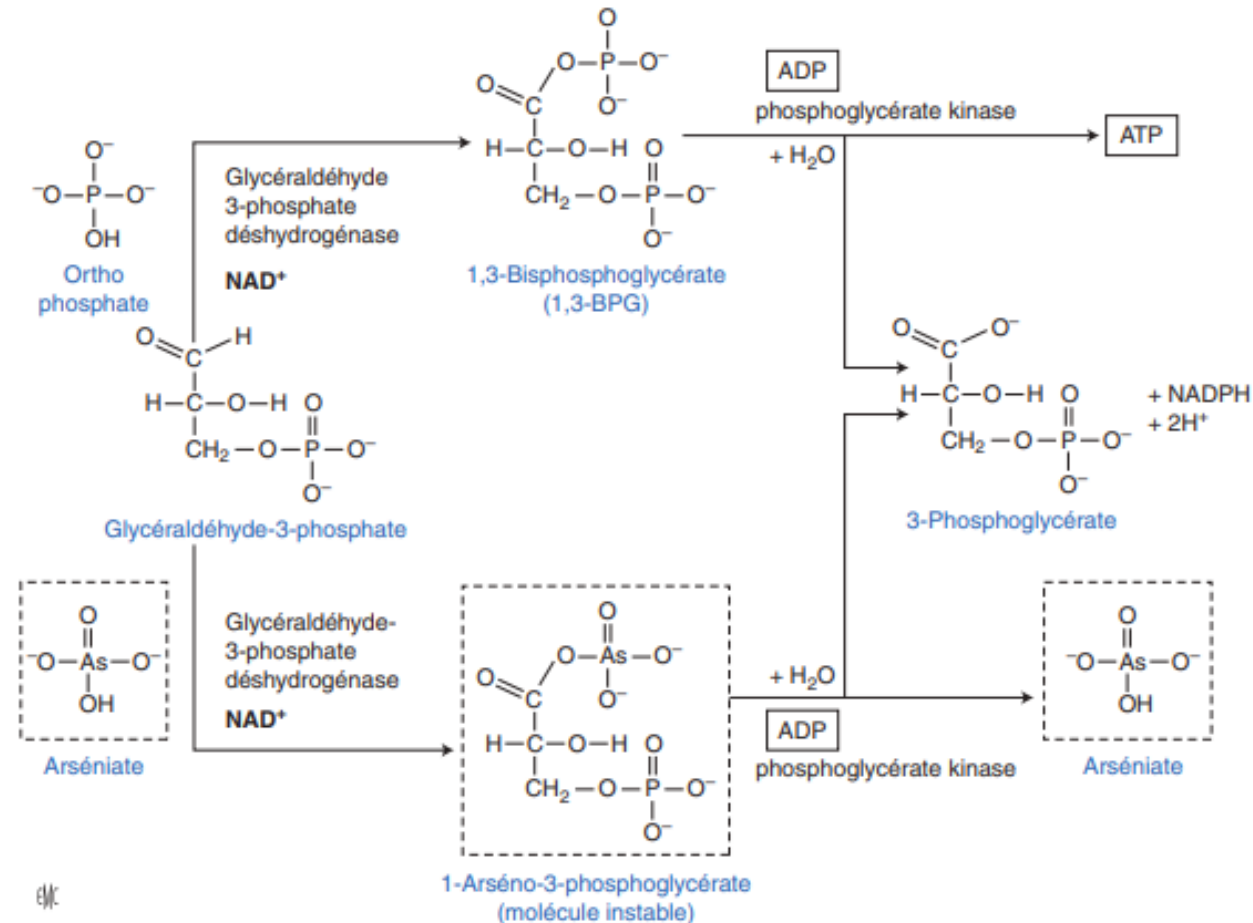


Figure 7. Passage du glycéraldéhyde-3-phosphate au 3-phosphoglycérate, en présence d'arséniate.