

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

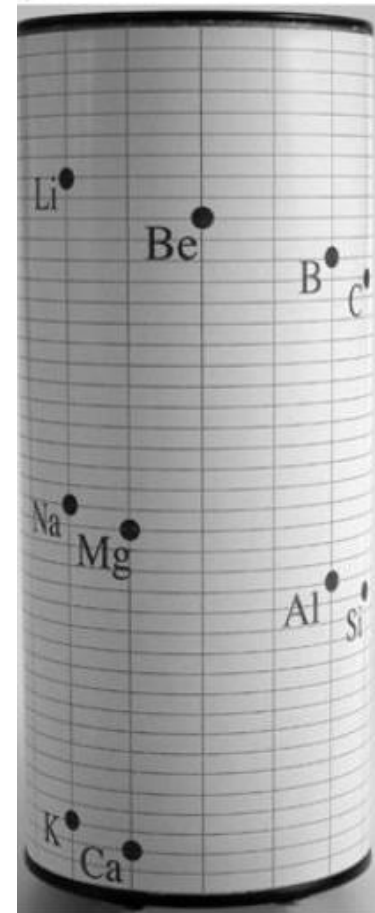
Raisonnement historique : découverte des éléments

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)



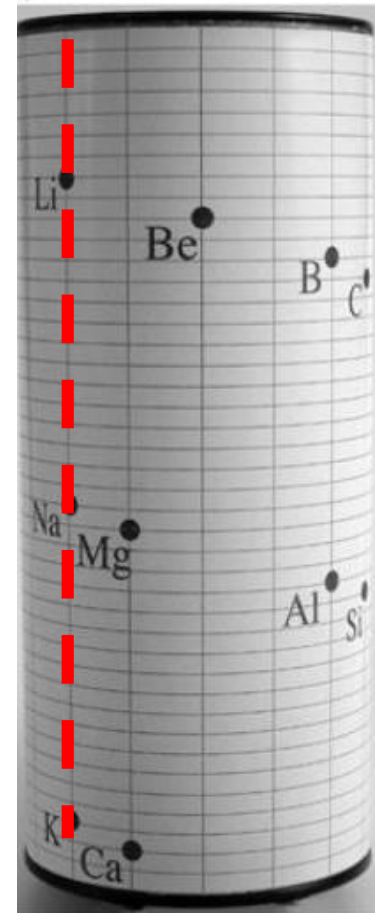
Raisonnement historique : classification en masse et par propriétés par Chancourtois et vis tellurique



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=106,8	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=75,8	Th=118?
		Cs=133	Tl=204.
		Ba=137	Pb=207.

Д. Менделѣевъ

Configuration et blocs

PERIODIC TABLE OF ELEMENTS

<div>PubChem</div>																		2														
<div>1</div> <div>H</div> <div>Hydrogen</div> <div>1s¹</div>																		2														
<div>Atomic Number</div> <div>Symbol</div> <div>Name</div> <div>Electron Configuration</div>																																
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															81	82	83	84	85	86											
Cs	Ba															Tl	Pb	Bi	Po	At	Rn											
Cesium	Barium															Thallium	Lead	Bismuth	Polonium	Astatine	Radon											
87	88															113	114	115	116	117	118											
Fr	Ra															Nh	Fl	Mc	Lv	Ts	Og											
Francium	Radium															Nihonium	Flerovium	Moscovium	Livermorium	Tennessine	Oganesson											
																		57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
																		La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
																		Lanthanum	Cerium	Praseodymium	Neodymium	Promethium	Samarium	Europium	Gadolinium	Terbium	Dysprosium	Holmium	Erbium	Thulium	Ytterbium	Lutetium
																		89	90	91	92	93	94	95	96	97	98	99	100	101	102	103
																		Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr
																		Actinium	Thorium	Protactinium	Uranium	Neptunium	Plutonium	Americium	Curium	Berkelium	Californium	Einsteinium	Fermium	Mendelevium	Nobelium	Lawrencium

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

Energie d'ionisation

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 5d ¹ 7s ²					

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PERIODIC TABLE OF ELEMENTS

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Electronégativité

PERIODIC TABLE OF ELEMENTS

<div>PubChem</div>																																			
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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					
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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	
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87 Fr Francium [Rn]7s ¹		88 Ra Radium [Rn]7s ²		••		104 Rf Rutherfordium [Rn]5f ¹⁴ 6s ² 6p ²		105 Db Dubnium [Rn]5f ¹⁴ 6s ² 6p ³		106 Sg Seaborgium [Rn]5f ¹⁴ 6s ² 6p ⁴		107 Bh Bohrium [Rn]5f ¹⁴ 6s ² 6p ⁵		108 Hs Hassium [Rn]5f ¹⁴ 6s ² 6p ⁶		109 Mt Meitnerium [Rn]5f ¹⁴ 6s ² 6p ⁷		110 Ds Darmstadtium [Rn]5f ¹⁴ 6s ² 6p ⁸		111 Rg Roentgenium [Rn]5f ¹⁴ 6s ² 6p ⁹		112 Cn Copernicium [Rn]5f ¹⁴ 6s ² 6p ¹⁰		113 Nh Nihonium [Rn]5f ¹⁴ 6s ² 6p ¹¹		114 Fl Flerovium [Rn]5f ¹⁴ 6s ² 6p ¹²		115 Mc Moscovium [Rn]5f ¹⁴ 6s ² 6p ¹³		116 Lv Livermorium [Rn]5f ¹⁴ 6s ² 6p ¹⁴		117 Ts Tennessine [Rn]5f ¹⁴ 6s ² 6p ¹⁵		118 Og Oganesson [Rn]5f ¹⁴ 6s ² 6p ¹⁶	
•		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					

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

Rayon atomique

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

37

Rb

Rubidium

[Kr]5s¹

38

Sr

Strontium

[Kr]5s²

55

Cs

Cesium

[Xe]6s¹

56

Ba

Barium

[Xe]6s²

87

Fr

Francium

[Rn]7s¹

88

Ra

Radium

[Rn]7s²

1

H

Hydrogen

1s¹

Atomic Number

Symbol

Name

Electron Configuration

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

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

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

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

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

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

<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>$[Rn]5f^{14} 5d^1 7s^2$</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

118

Og

Oganesson

¹¹⁸₁₁₈Og

16

S

Sulfur

¹⁶₁₆S

34

Se

Selenium

³⁴₃₄Se

52

Te

Tellurium

⁵²₅₂Te

84

Po

Polonium

⁸⁴₈₄Po

116

Lv

Livermorium

¹¹⁶₁₁₆Lv

6

C

Carbon

⁶₆C

14

Si

Silicon

¹⁴₁₄Si

32

Ge

Germanium

³²₃₂Ge

50

Sn

Tin

⁵⁰₅₀Sn

82

Pb

Lead

⁸²₈₂Pb

114

Fl

Flerovium

¹¹⁴₁₁₄Fl

7

N

Nitrogen

⁷₇N

15

P

Phosphorus

¹⁵₁₅P

33

As

Arsenic

³³₃₃As

51

Sb

Antimony

⁵¹₅₁Sb

83

Bi

Bismuth

⁸³₈₃Bi

115

Mc

Moscovium

¹¹⁵₁₁₅Mc

5

B

Boron

⁵₅B

13

Al

Aluminum

¹³₁₃Al

31

Ga

Gallium

³¹₃₁Ga

49

In

Indium

⁴⁹₄₉In

81

Tl

Thallium

⁸¹₈₁Tl

113

Nh

Nihonium

¹¹³₁₁₃Nh

8

O

Oxygen

⁸₈O

16

S

Sulfur

¹⁶₁₆S

34

Se

Selenium

³⁴₃₄Se

52

Te

Tellurium

⁵²₅₂Te

84

Po

Polonium

⁸⁴₈₄Po

116

Lv

Livermorium

¹¹⁶₁₁₆Lv

9

F

Fluorine

⁹₉F

17

Cl

Chlorine

¹⁷₁₇Cl

35

Br

Bromine

³⁵₃₅Br

53

I

Iodine

⁵³₅₃I

85

At

Astatine

⁸⁵₈₅At

117

Ts

Tennessine

¹¹⁷₁₁₇Ts

1

H

Hydrogen

¹₁H

2

He

Helium

²₂He

3

Li

Lithium

³₃Li

4

Be

Beryllium

⁴₄Be

5

B

Boron

⁵₅B

6

C

Carbon

⁶₆C

7

N

Nitrogen

⁷₇N

8

O

Oxygen

⁸₈O

9

F

Fluorine

⁹₉F

10

Ne

Neon

¹⁰₁₀Ne

11

Na

Sodium

¹¹₁₁Na

12

Mg

Magnesium

¹²₁₂Mg

13

Al

Aluminum

¹³₁₃Al

14

Si

Silicon

¹⁴₁₄Si

15

P

Phosphorus

¹⁵₁₅P

16

S

Sulfur

¹⁶₁₆S

17

Cl

Chlorine

¹⁷₁₇Cl

18

Ar

Argon

¹⁸₁₈Ar

19

K

Potassium

¹⁹₁₉K

20

Ca

Calcium

²⁰₂₀Ca

21

Sc

Scandium

²¹₂₁Sc

22

Ti

Titanium

²²₂₂Ti

23

V

Vanadium

²³₂₃V

24

Cr

Chromium

²⁴₂₄Cr

25

Mn

Manganese

²⁵₂₅Mn

26

Fe

Iron

²⁶₂₆Fe

27

Co

Cobalt

²⁷₂₇Co

28

Ni

Nickel

²⁸₂₈Ni

29

Cu

Copper

²⁹₂₉Cu

30

Zn

Zinc

³⁰₃₀Zn

31

Ga

Gallium

³¹₃₁Ga

32

Ge

Germanium

³²₃₂Ge

33

As

Arsenic

³³₃₃As

34

Se

Selenium

³⁴₃₄Se

35

Br

Bromine

³⁵₃₅Br

36

Kr

Krypton

³⁶₃₆Kr

37

Rb

Rubidium

³⁷₃₇Rb

38

Sr

Strontium

³⁸₃₈Sr

39

Y

Yttrium

³⁹₃₉Y

40

Zr

Zirconium

⁴⁰₄₀Zr

41

Nb

Niobium

⁴¹₄₁Nb

42

Mo

Molybdenum

⁴²₄₂Mo

43

Tc

Technetium

⁴³₄₃Tc

44

Ru

Ruthenium

⁴⁴₄₄Ru

45

Rh

Rhodium

⁴⁵₄₅Rh

46

Pd

Palladium

⁴⁶₄₆Pd

47

Ag

Silver

⁴⁷₄₇Ag

48

Cd

Cadmium

⁴⁸₄₈Cd

49

In

Indium

⁴⁹₄₉In

50

Sn

Tin

⁵⁰₅₀Sn

51

Sb

Antimony

⁵¹₅₁Sb

52

Te

Tellurium

⁵²₅₂Te

53

I

Iodine

⁵³₅₃I

54

Xe

Xenon

⁵⁴₅₄Xe

55

Cs

Cesium

⁵⁵₅₅Cs

56

Ba

Barium

⁵⁶₅₆Ba

57

La

Lanthanum

⁵⁷₅₇La

58

Ce

Cerium

⁵⁸₅₈Ce

59

Pr

Praseodymium

⁵⁹₅₉Pr

60

Nd

Neodymium

⁶⁰₆₀Nd

61

Pm

Promethium

⁶¹₆₁Pm

62

Sm

Samarium

⁶²₆₂Sm

63

Eu

Europium

⁶³₆₃Eu

64

Gd

Gadolinium

⁶⁴₆₄Gd

65

Tb

Terbium

⁶⁵₆₅Tb

66

Dy

Dysprosium

⁶⁶₆₆Dy

67

Ho

Holmium

⁶⁷₆₇Ho

68

Er

Erbium

⁶⁸₆₈Er

69

Tm

Thulium

⁶⁹₆₉Tm

70

Yb

Ytterbium

⁷⁰₇₀Yb

71

Lu

Lutetium

⁷¹₇₁Lu

72

Hf

Hafnium

⁷²₇₂Hf

73

Ta

Tantalum

⁷³₇₃Ta

74

W

Tungsten

⁷⁴₇₄W

75

Re

Rhenium

⁷⁵₇₅Re

76

Os

Osmium

⁷⁶₇₆Os

77

Ir

Iridium

⁷⁷₇₇Ir

78

Pt

Platinum

⁷⁸₇₈Pt

79

Au

Gold

⁷⁹₇₉Au

80

Hg

Mercury

⁸⁰₈₀Hg

81

Tl

Thallium

⁸¹₈₁Tl

82

Pb

Lead

⁸²₈₂Pb

83

Bi

Bismuth

⁸³₈₃Bi

84

Po

Polonium

⁸⁴₈₄Po

85

At

Astatine

⁸⁵₈₅At

86

Rn

Radon

⁸⁶₈₆Rn

87

Fr

Francium

⁸⁷₈₇Fr

88

Ra

Radium

⁸⁸₈₈Ra

89

Ac

Actinium

⁸⁹₈₉Ac

90

Th

Thorium

⁹⁰₉₀Th

91

Pa

Protactinium

⁹¹₉₁Pa

92

U

Uranium

⁹²₉₂U

93

Np

Neptunium

⁹³₉₃Np

94

Pu

Plutonium

⁹⁴₉₄Pu

95

Am

Americium

⁹⁵₉₅Am

96

Cm

Curium

⁹⁶₉₆Cm

97

Bk

Berkelium

⁹⁷₉₇Bk

98

Cf

Californium

⁹⁸₉₈Cf

99

Es

Einsteinium

⁹⁹₉₉Es

100

Fm

Fermium

¹⁰⁰₁₀₀Fm

101

Md

Mendelevium

¹⁰¹₁₀₁Md

102

No

Nobelium

¹⁰²₁₀₂No

103

Lr

Lawrencium

¹⁰³₁₀₃Lr

1

H

Hydrogen

¹₁H

2

He

Helium

²₂He

3

Li

Lithium

³₃Li

4

Be

Beryllium

⁴₄Be

5

B

Boron

⁵₅B

6

C

Carbon

⁶₆C

7

N

Nitrogen

⁷₇N

8

O

Oxygen

⁸₈O

9

F

Fluorine

⁹₉F

10

Ne

Neon

¹⁰₁₀Ne

11

Na

Sodium

¹¹₁₁Na

12

Mg

Magnesium

¹²₁₂Mg

13

Al

Aluminum

¹³₁₃Al

14

Si

Silicon

¹⁴₁₄Si

15

P

Phosphorus

¹⁵₁₅P

16

S

Sulfur

¹⁶₁₆S

17

Cl

Chlorine

¹⁷₁₇Cl

18

Ar

Argon

¹⁸₁₈Ar

19

K

Potassium

¹⁹₁₉K

20

Ca

Calcium

²⁰₂₀Ca

21

Sc

Scandium

²¹₂₁Sc

22

Ti

Titanium

²²₂₂Ti

23

V

Vanadium

²³₂₃V

24

Cr

Chromium

²⁴₂₄Cr

25

Mn

Manganese

²⁵₂₅Mn

26

Fe

Iron

²⁶₂₆Fe

27

Co

Cobalt

²⁷₂₇Co

28

Ni

Nickel

²⁸₂₈Ni

29

Cu

Copper

²⁹₂₉Cu

30

Zn

Zinc

³⁰₃₀Zn

31

Ga

Gallium

³¹₃₁Ga

32

Ge

Germanium

³²₃₂Ge

33

As

Arsenic

³³₃₃As

34

Se

Selenium

³⁴₃₄Se

35

Br

Bromine

³⁵₃₅Br

36

Kr

Krypton

³⁶₃₆Kr

37

Rb

Rubidium

³⁷₃₇Rb

38

Sr

Strontium

³⁸₃₈Sr

39

Y

Yttrium

³⁹₃₉Y

40

Zr

Zirconium

⁴⁰₄₀Zr

41

Nb

Niobium

⁴¹₄₁Nb

42

Mo

Molybdenum

⁴²₄₂Mo

43

Tc

Technetium

⁴³₄₃Tc

44

Ru

Ruthenium

⁴⁴₄₄Ru

45

Rh

Rhodium

⁴⁵₄₅Rh

46

Pd

Palladium

⁴⁶₄₆Pd

47

Ag

Silver

⁴⁷₄₇Ag

48

Cd

Cadmium

⁴⁸₄₈Cd

49

In

Indium

⁴⁹₄₉In

50

Sn

Tin

⁵⁰₅₀Sn

51

Sb

Antimony

⁵¹₅₁Sb

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Te

Tellurium

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53

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⁵³₅₃I

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Lu

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⁷¹₇₁Lu

72

Hf

Hafnium

⁷²₇₂Hf

73

Ta

Tantalum

⁷³₇₃Ta

74

W

Tungsten

⁷⁴₇₄W

75

Re

Rhenium

⁷⁵₇₅Re

76

Os

Osmium

⁷⁶₇₆Os

77

Ir

Iridium

⁷⁷₇₇Ir

78

Pt

Platinum

⁷⁸₇₈Pt

79

Au

Gold

⁷⁹₇₉Au

80

Hg

Mercury

⁸⁰₈₀Hg

81

Tl

Thallium

⁸¹₈₁Tl

82

Pb

Lead

⁸²₈₂Pb

83

Bi

Bismuth

⁸³₈₃Bi

84

Po

Polonium

⁸⁴₈₄Po

85

At

Astatine

⁸⁵₈₅At

86

Rn

Radon

⁸⁶₈₆Rn

87

Fr

Francium

⁸⁷₈₇Fr

88

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Radium

⁸⁸₈₈Ra

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Thorium

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Americium

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96

Cm

Curium

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97

Bk

Berkelium

⁹⁷₉₇Bk

98

Cf

Californium

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¹₁H

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Li

Lithium

³₃Li

4

Be

Beryllium

⁴₄Be

5

B

Boron

⁵₅B

6

C

Carbon

⁶₆C

7

N

Nitrogen

⁷₇N

8

O

Oxygen

⁸₈O

9

F

Fluorine

⁹₉F

10

Ne

Neon

¹⁰₁₀Ne

11

Na

Sodium

¹¹₁₁Na

12

Mg

Magnesium

¹²₁₂Mg

13

Al

Aluminum

¹³₁₃Al

14

Si

Silicon

¹⁴₁₄Si

15

P

Phosphorus

¹⁵₁₅P

16

S

Sulfur

¹⁶₁₆S

17

Cl

Chlorine

¹⁷₁₇Cl

18

Ar

Argon

¹⁸₁₈Ar

19

K

Potassium

¹⁹₁₉K

20

Ca

Calcium

²⁰₂₀Ca

21

Sc

Scandium

²¹₂₁Sc

22

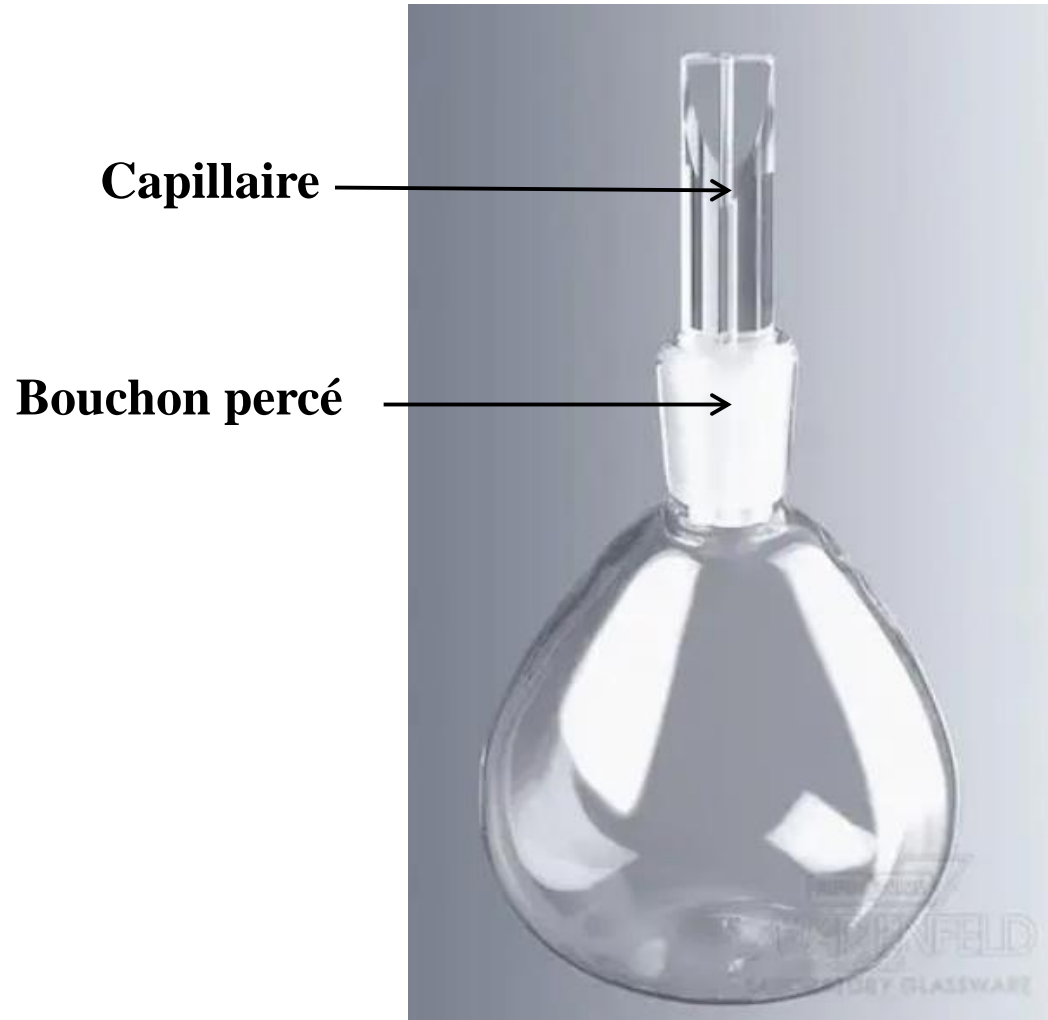
Ti

Bons réducteurs

Bons oxydants

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

Détermination de longueur de liaison

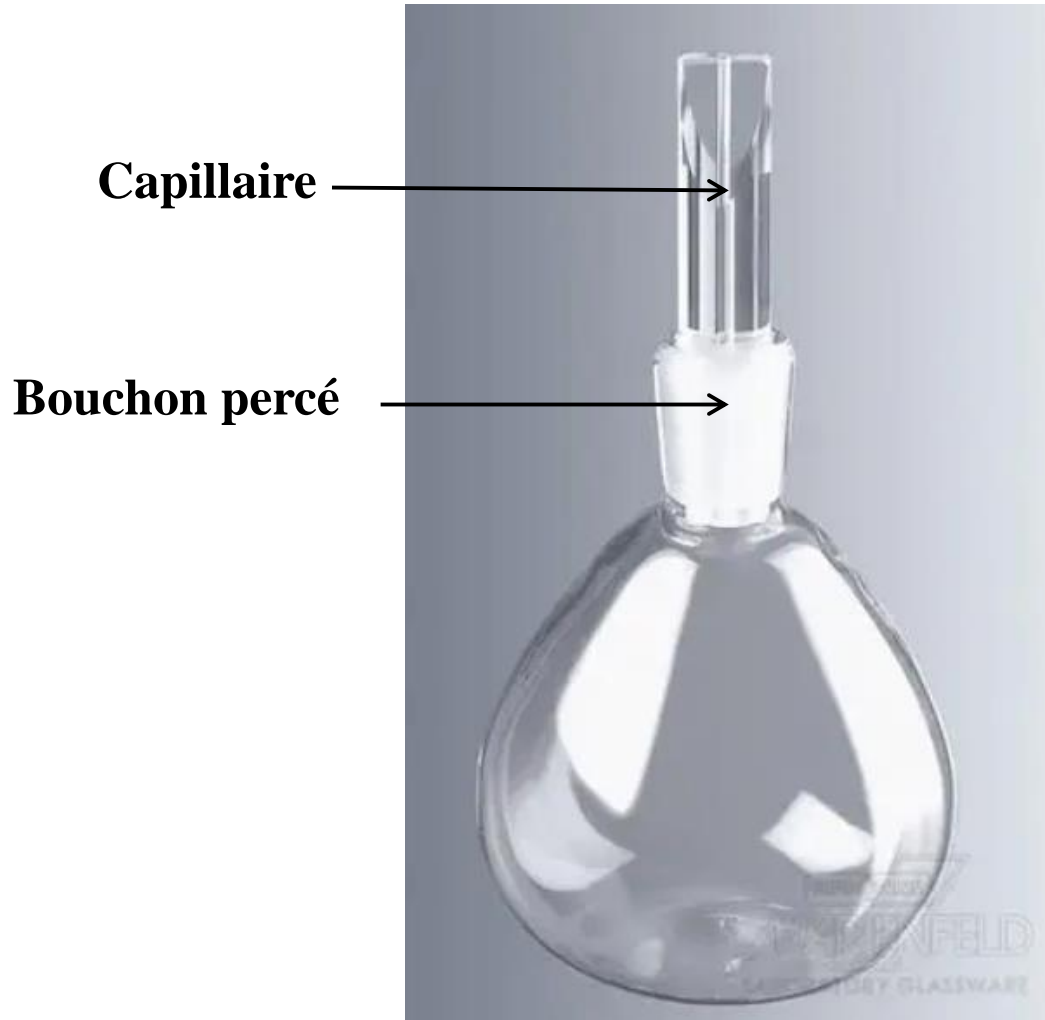


- On pèse le pycnomètre à vide : m_{pyc}
- On pèse le pycnomètre rempli de cyclohexane : $m_{pyc+cyclo}$

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

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

Détermination de longueur de liaison

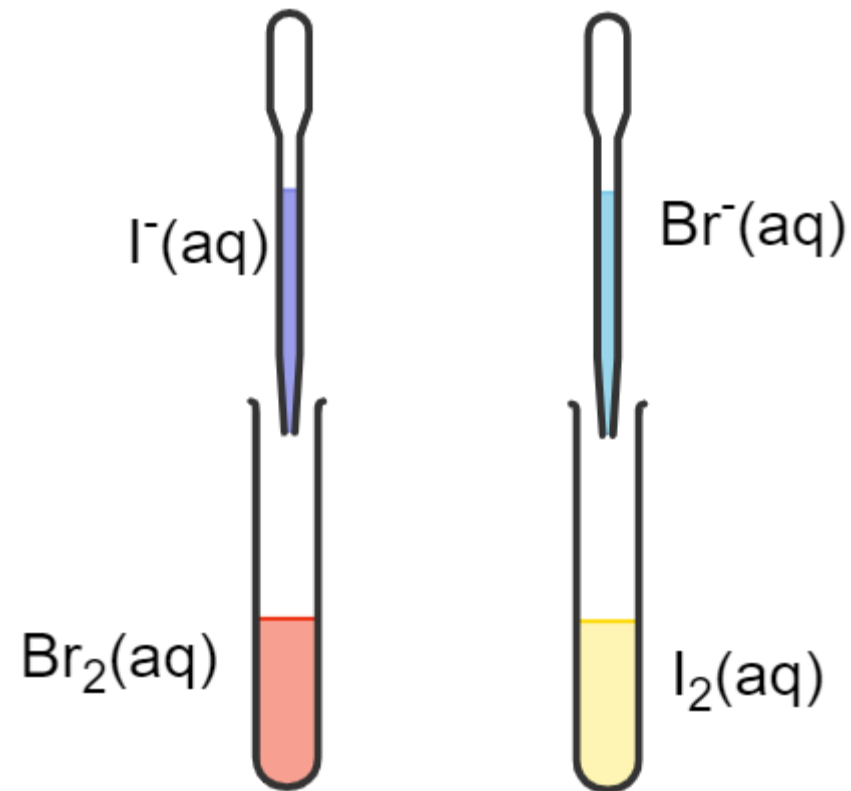


- On met une masse m de solide
- On remplit de cyclohexane
- On pèse à nouveau

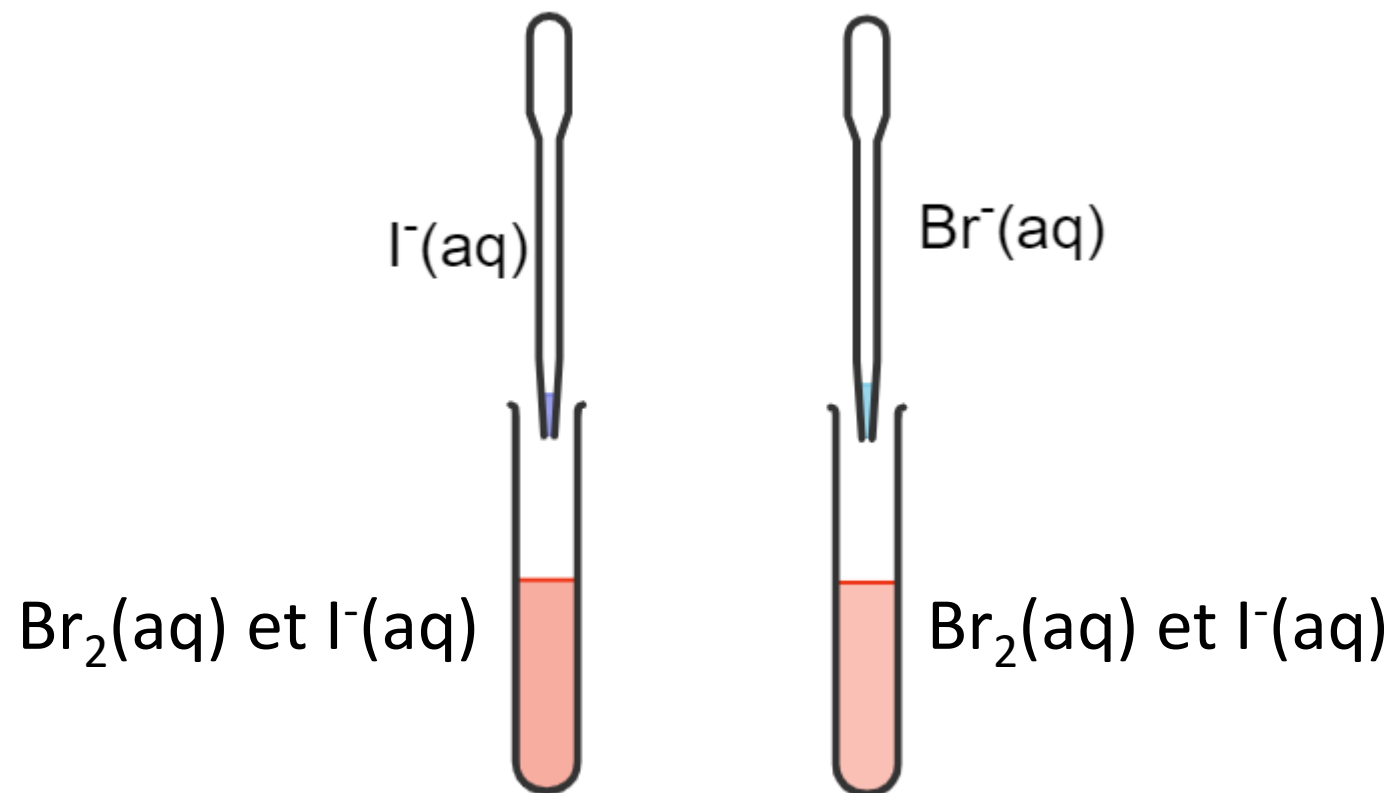
$$\rho = \frac{m\rho_{cyclo}}{(m_{tot} - m - m_{pyc})}$$

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

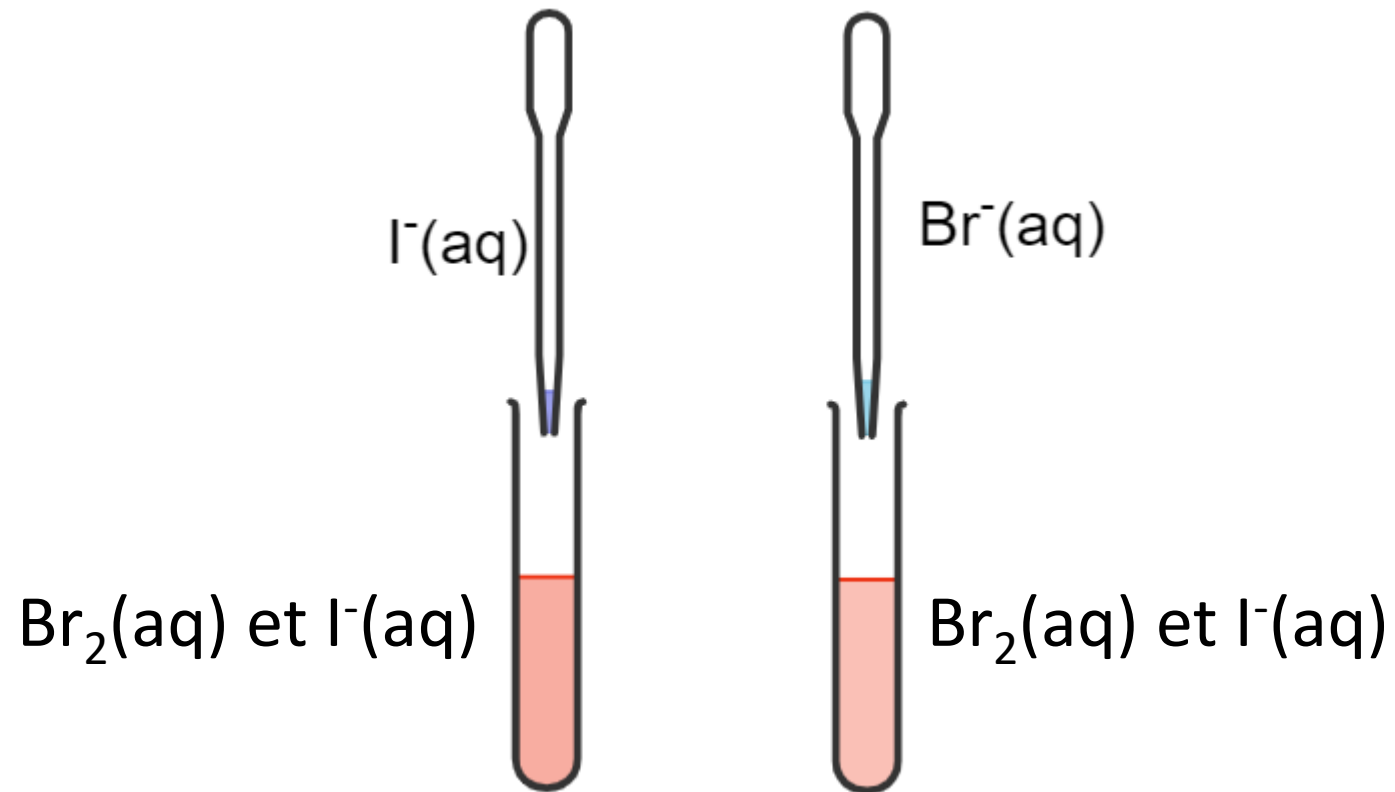
Pouvoir oxydant des halogènes



Pouvoir oxydant des halogènes



Pouvoir oxydant des halogènes



Le brome oxyde le diiode

Annexe : Arsenic et phosphore

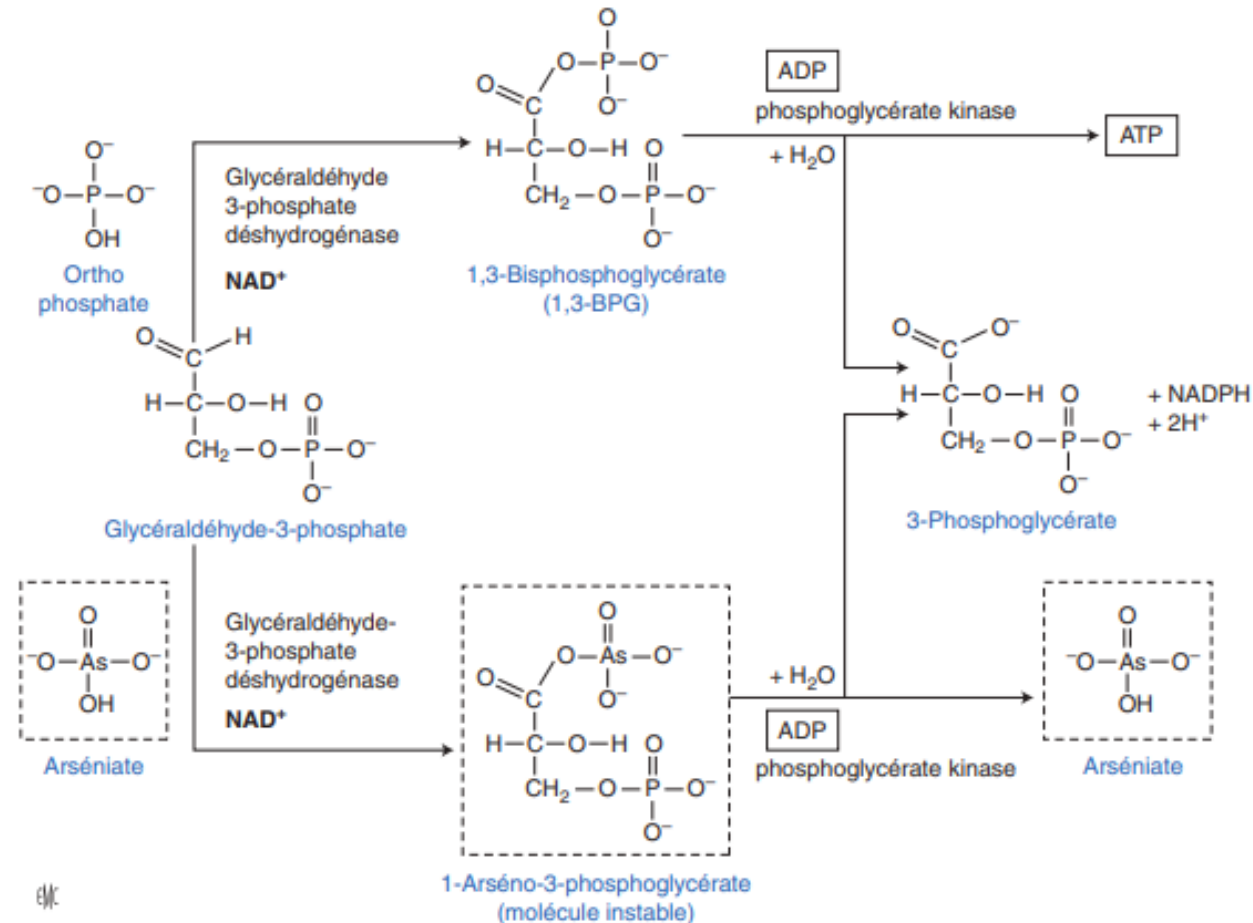


Figure 7. Passage du glycéraldéhyde-3-phosphate au 3-phosphoglycérate, en présence d'arséniate.