

Printing activity cards



Activity 1

Easy version

(front)

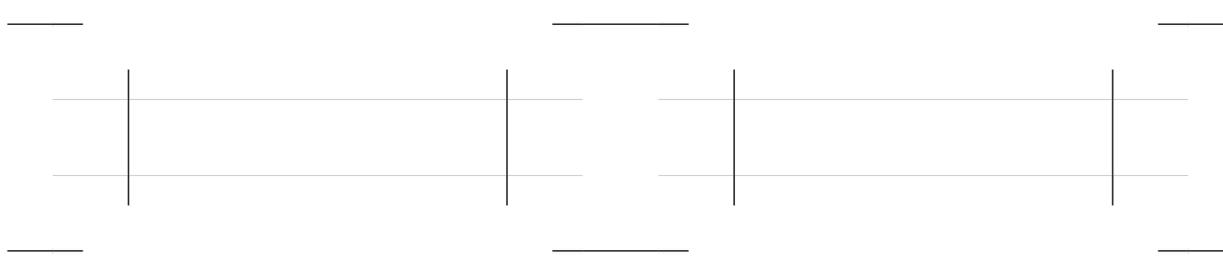


H

Hydrogen

He

Helium



B

Boron

C

Carbon

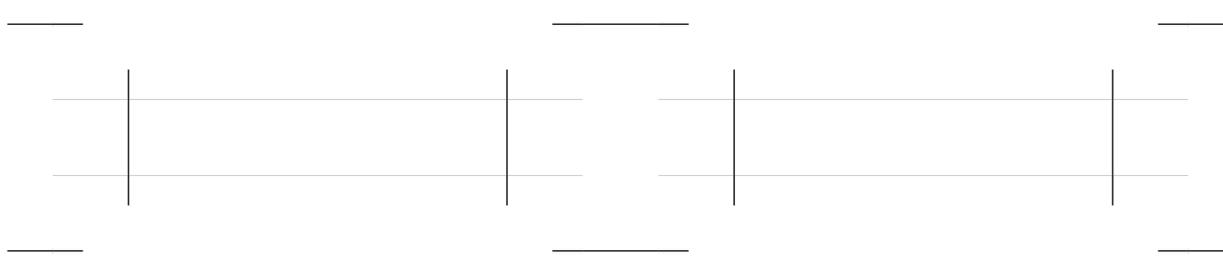


N

Nitrogen

O

Oxygen



Fe

Iron

F

Fluorine



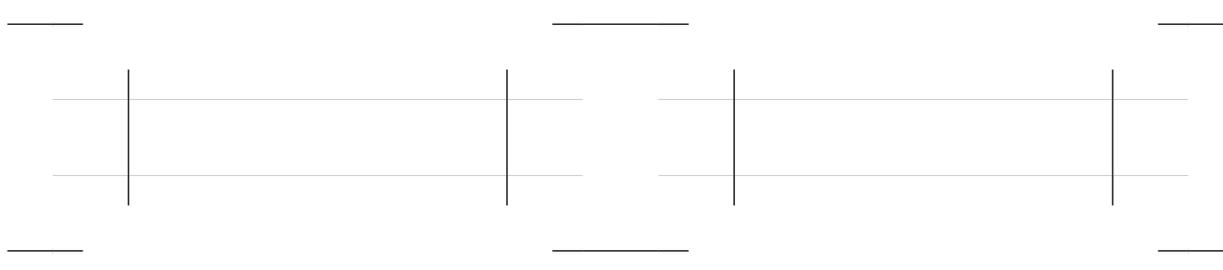


Ag

Silver

Au

Gold



Cu

Copper

Ca

Calcium



1 proton

2 protons

5 protons

6 protons

7 protons

8 protons

9 protons

20 protons

26 protons

29 protons

47 protons

79 protons

Activity 1

Difficult version
(front)

U

Uranium

Po

Polonium

Ra

Radium

Rn

Radon

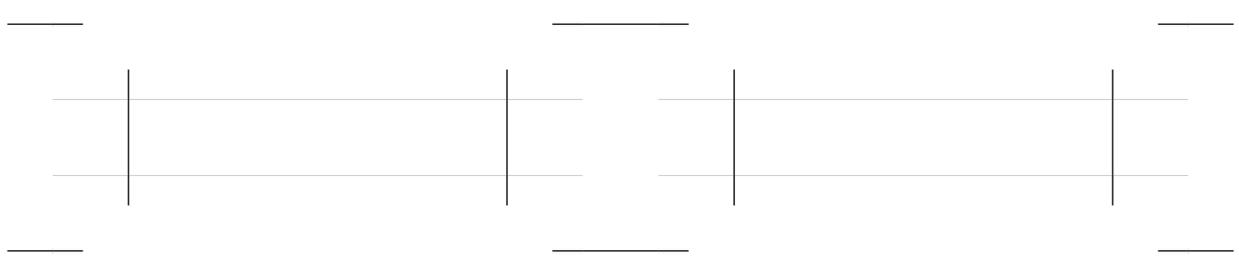


Pb

Lead

Bi

Bismuth



Th

Thorium

Fr

Francium



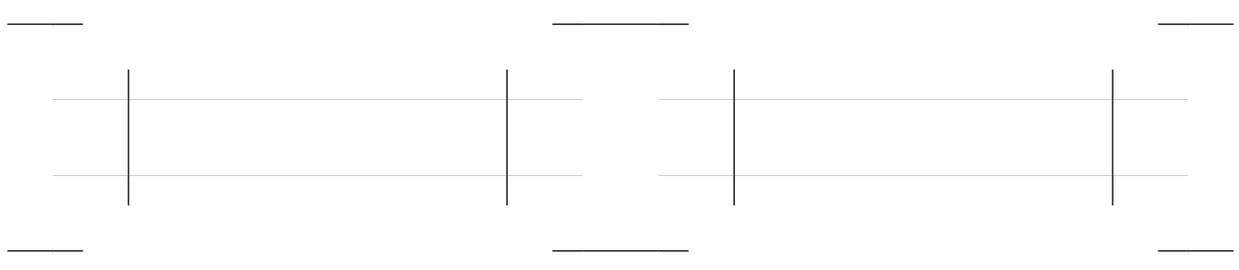


Ac

Actinium

Pa

Protactinium



At

Astatine

Hg

Mercury



80 protons

82 protons

83 protons

84 protons

85 protons

86 protons

87 protons

88 protons

89 protons

90 protons

91 protons

92 protons

Activity 2

Easy version

(front)

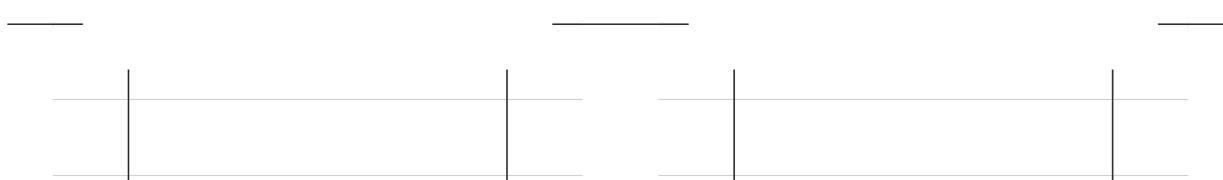


^1H

Hydrogen 1

^2H

Hydrogen 2
(Deuterium)



^3H

Hydrogen 3
(Tritium)

^4He

Helium 4

^{12}B

Boron 12

^{12}N

Nitrogen 12

^{12}C

Carbon 12

^{11}B

Boron 11

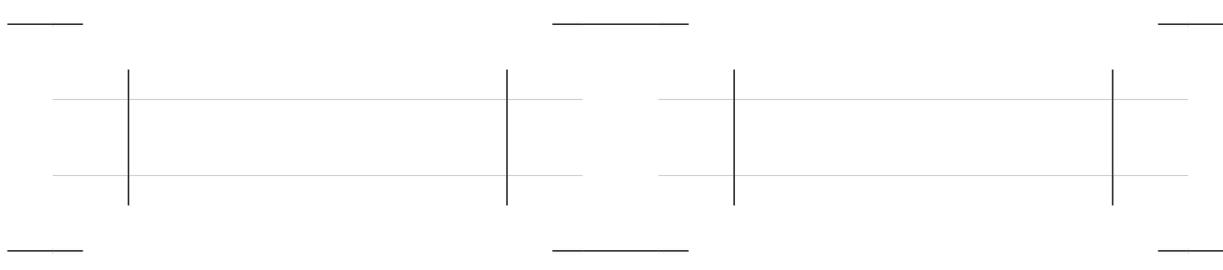


11C

Carbon 11

13C

Carbon 13



13N

Nitrogen 13

13B

Boron 13



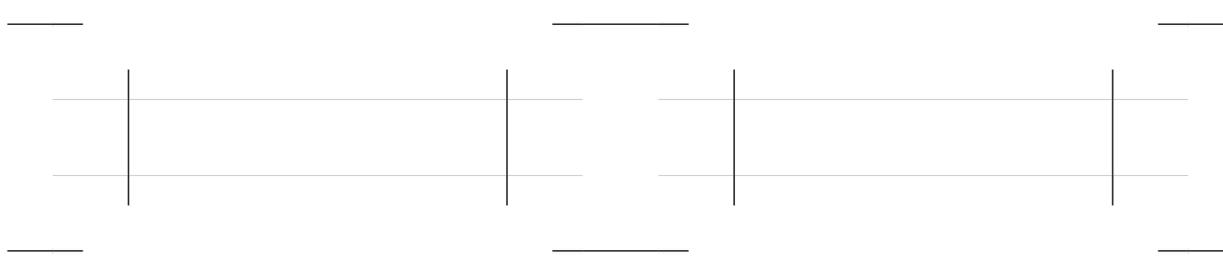


14C

Carbon 14

14O

Oxygen 14



14N

Nitrogen 14

15N

Nitrogen 15



1

proton

1

proton

1

proton

0

neutron

1

neutron

2

neutrons

5

protons

5

protons

5

protons

6

neutrons

7

neutrons

8

neutrons

6

protons

6

protons

6

protons

5

neutrons

6

neutrons

7

neutrons

6

protons

2

protons

8

protons

8

neutrons

2

neutrons

6

neutrons



7

protons

7

protons

7

protons

5

neutrons

6

neutrons

7

neutrons

7

A row of five vertical lines with horizontal dashes below them.

protons

8

protons

8

protons

8

neutrons

5

neutrons

7

neutrons



Activity 2

**Difficult version
(front)**

238U

Uranium 238

235U

Uranium 235

234Th

Thorium 234

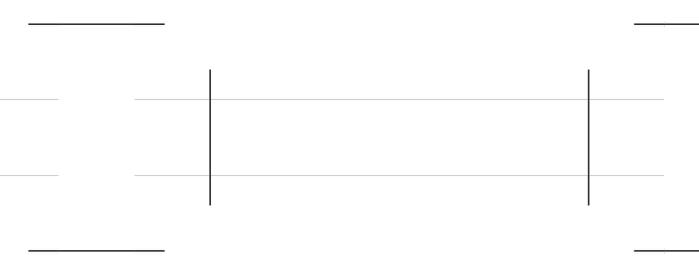
226Ra

Radium 226



^{206}Pb

Lead 206



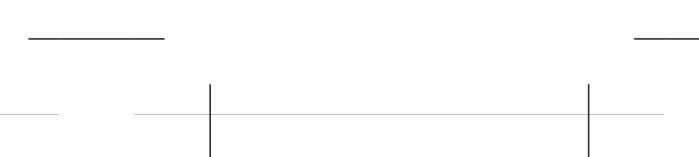
^{214}Po

Polonium 214



^{234}U

Uranium 234



^{232}Th

Thorium 232

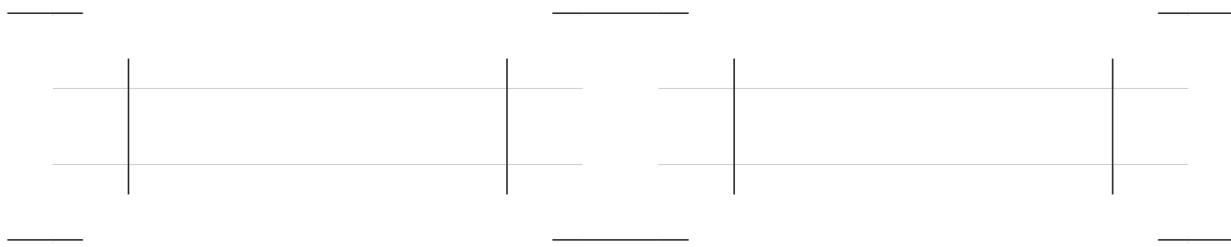


222Rn

Radon 222

210Po

Polonium 210



218Po

Polonium 218

210Pb

Lead 210



92

protons

92

protons

92

protons

146

neutrons

143

neutrons

142

neutrons

84

protons

84

protons

84

protons

126

neutrons

134

neutrons

130

neutrons

90

protons

90

protons

88

protons

144

neutrons

142

neutrons

138

neutrons

86

protons

82

protons

82

protons

136

neutrons

124

neutrons

128

neutrons

Activity 3

(Front-back)

5 protons ●
5 neutrons ●

10 **B**

stable core
(low abundance)

5 protons ●
6 neutrons ●

11 **B**

stable core

5 protons ●
7 neutrons ●

12 **B** ☢

radioactive core

1 neutron transforms into 1 proton



We get ?

5 protons ●
8 neutrons ●

13 **B** ☢

radioactive core

1 neutron transforms into 1 proton



We get ?

5 protons

B

Boron

5 protons

B

Boron

5 protons

B

Boron

5 protons

B

Boron

6 protons ●
6 neutrons ●

12C

stable core

6 protons ●
7 neutrons ●

13C

stable core
(low abundance)

6 protons ●
5 neutrons ●

11C[⊗]

radioactive core

1 proton transforms into 1 neutron



We get ?

6 protons ●
8 neutrons ●

14C[⊗]

radioactive core

1 neutron transforms into 1 proton



We get ?

6 protons

C

Carbon

6 protons

C

Carbon

6 protons

C

Carbon

6 protons

C

Carbon

9 protons ●
10 neutrons ●

19 F

stable core

9 protons ●
9 neutrons ●

18 F[⊕]

radioactive core

1 proton transforms into 1 neutron



We get ?

8 protons ●
11 neutrons ●

19 O[⊕]

radioactive core

1 neutron transforms into 1 proton



We get ?

8 protons ●
6 neutrons ●

14 O[⊕]

radioactive core

1 proton transforms into 1 neutron



We get ?

9 protons

F

Fluorine

9 protons

F

Fluorine

8 protons

O

Oxygen

8 protons

O

Oxygen

7 protons ●
7 neutrons ●

14N

stable core

7 protons ●
8 neutrons ●

15N

stable core
(low abundance)

7 protons ●
6 neutrons ●

13N ☢

radioactive core

1 proton transforms into 1 neutron



We get ?

7 protons ●
9 neutrons ●

16N ☢

radioactive core

1 neutron transforms into 1 proton



We get ?

7 protons

N

Nitrogen

7 protons

N

Nitrogen

7 protons

N

Nitrogen

7 protons

N

Nitrogen

7 protons ●
5 neutrons ●



radioactive core

1 proton transforms into 1 neutron



We get ?

7 protons ●
10 neutrons ●



radioactive core

1 neutron transforms into 1 proton



We get ?

6 protons ●
4 neutrons ●



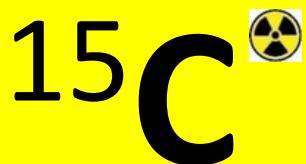
radioactive core

1 proton transforms into 1 neutron



We get ?

6 protons ●
9 neutrons ●



radioactive core

1 neutron transforms into 1 proton



We get ?

7 protons

N

Nitrogen

7 protons

N

Nitrogen

6 protons

C

Carbon

6 protons

C

Carbon

8 protons ●
8 neutrons ●

16 O

stable core

8 protons ●
9 neutrons ●

17 O

stable core
(low abundance)

8 protons ●
10 neutrons ●

18 O

stable core
(low abundance)

8 protons ●
7 neutrons ●

15 O 

radioactive core

1 proton transforms into 1 neutron



We get ?

8 protons

O

Oxygen

8 protons

O

Oxygen

8 protons

O

Oxygen

8 protons

O

Oxygen

Bêta plus radioactivity : β^+

A proton transforms into a neutron and
a positon (an anti-electron) (e^+) is created
and is ejected from the nucleus :

This is β^+ radiation

Bêta minus radioactivity : β^-

A neutron transforms into a proton and
an electron (e^-) is created and is ejected
from the nucleus :

This is β^- radiation

Bêta plus radioactivity : β^+

A proton transforms into a neutron and
a positon (an anti-electron) (e^+) is created
and is ejected from the nucleus :

This is β^+ radiation

Bêta minus radioactivity : β^-

A neutron transforms into a proton and
an electron (e^-) is created and is ejected
from the nucleus :

This is β^- radiation

Bêta plus radioactivity : β^+

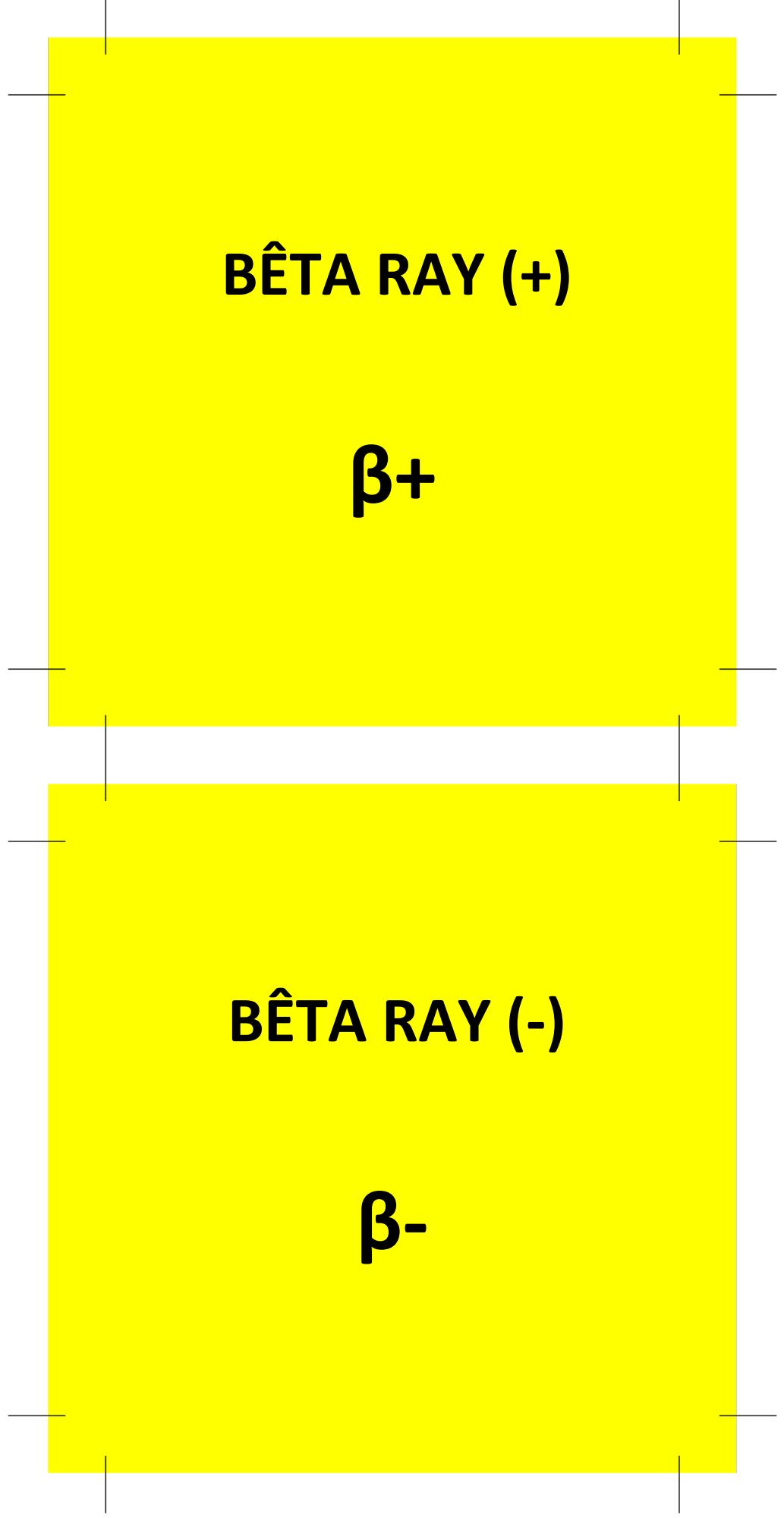
A proton transforms into a neutron and
a positon (an anti-electron) (e^+) is created
and is ejected from the nucleus :

This is β^+ radiation

Bêta minus radioactivity : β^-

A neutron transforms into a proton and
an electron (e^-) is created and is ejected
from the nucleus :

This is β^- radiation

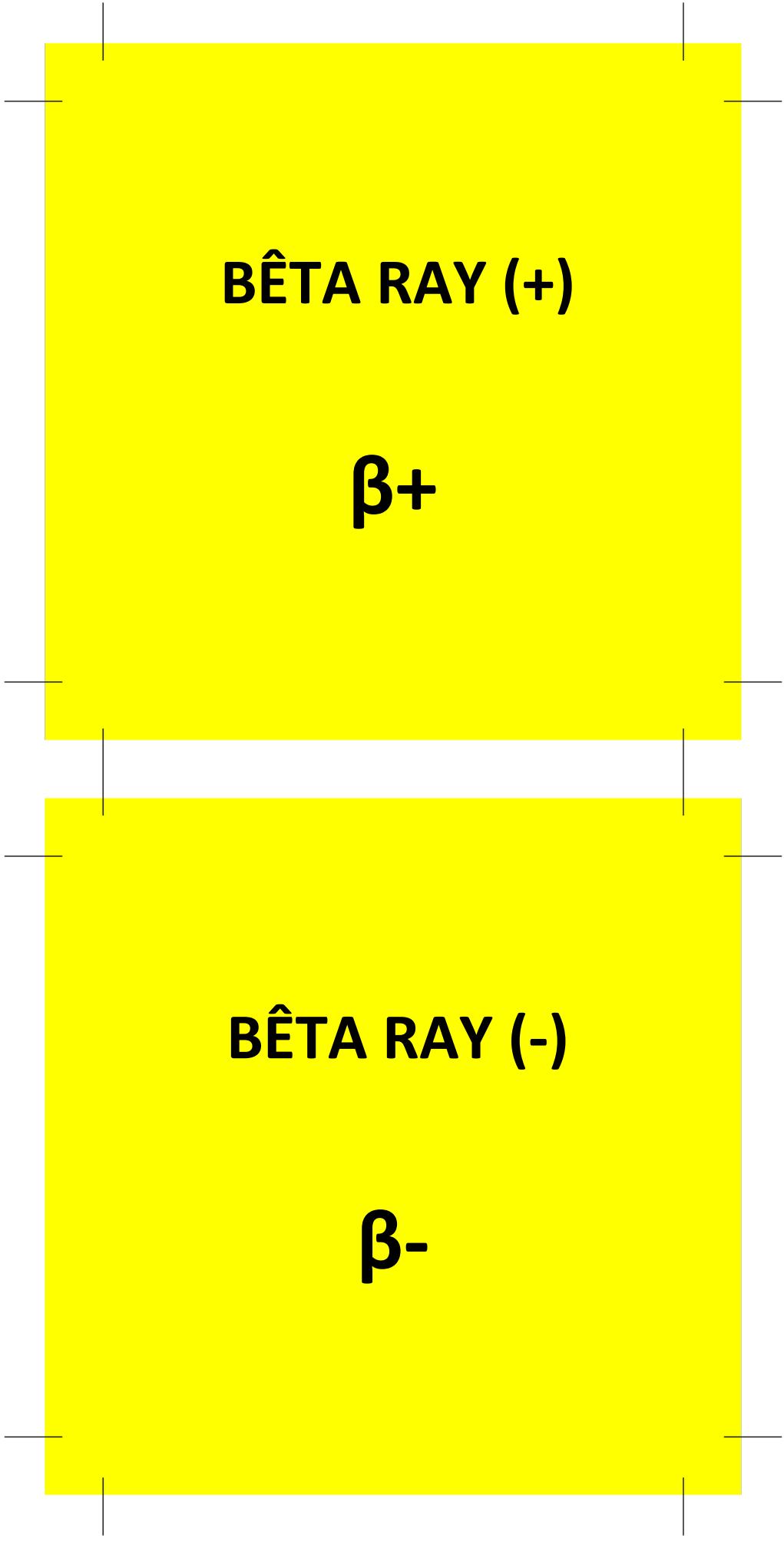


BÊTA RAY (+)

β^+

BÊTA RAY (-)

β^-

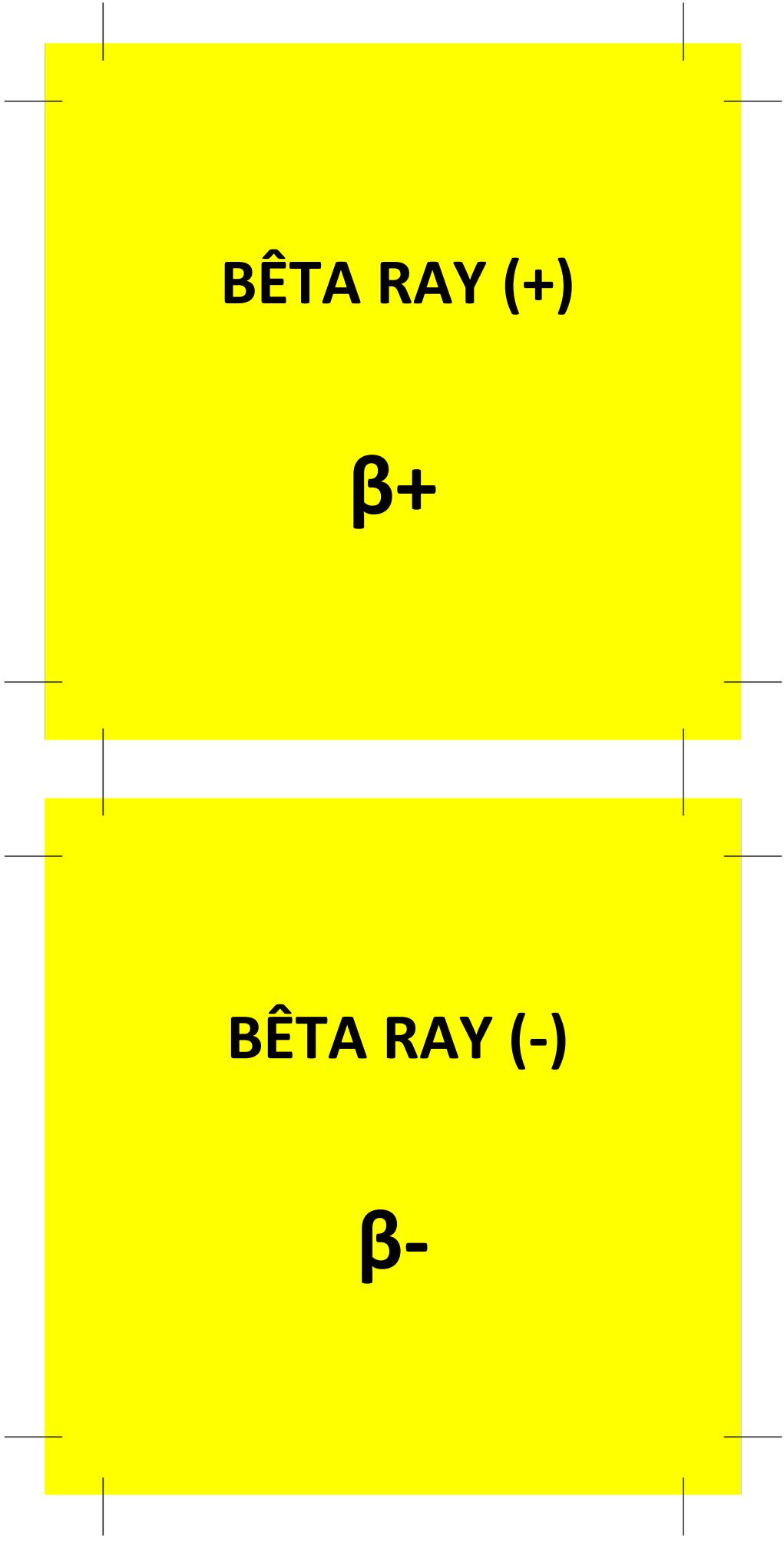


BÊTA RAY (+)

β^+

BÊTA RAY (-)

β^-



BÊTA RAY (+)

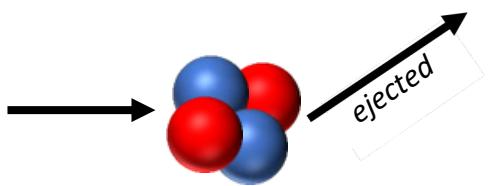
β^+

BÊTA RAY (-)

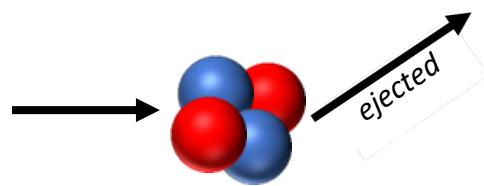
β^-

Activity 4

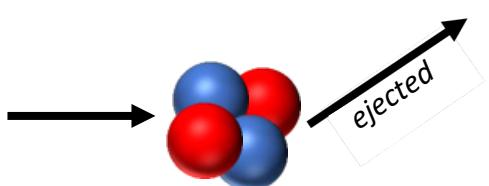
(front - solo)



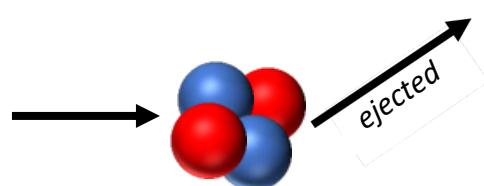
Hélium core 4He



Hélium core 4He

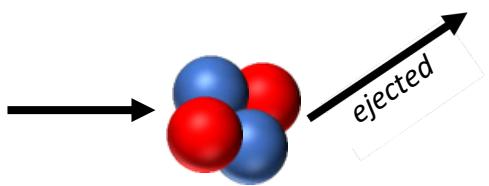


Hélium core 4He

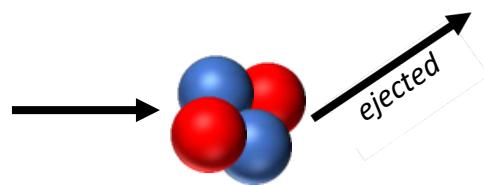


Hélium core 4He

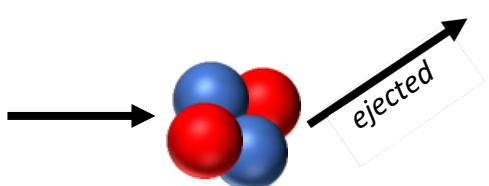




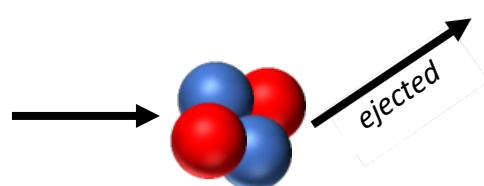
Hélium core ^4He



Hélium core ^4He



Hélium core ^4He



Hélium core ^4He



Activity 4

(Front-back)

85 protons

At

radioactive

89 protons

Ac

radioactive

87 protons

Fr

radioactive

83 protons

Bi

Radioactive
(very slightly radioactive)

89 protons

Ac

Actinium

85 protons

At

Astatine

83 protons

Bi

Bismuth

87 protons

Fr

Francium

88 protons



84 protons



lose 2 protons and 2 neutrons



a Hélium core (4He)

We get ?

lose 2 protons and 2 neutrons



a Hélium core (4He)

We get ?

86 protons



90 protons



lose 2 protons and 2 neutrons



a Hélium core (4He)

We get ?

lose 2 protons and 2 neutrons



a Hélium core (4He)

We get ?

84 protons

Po

Polonium

88 protons

Ra

Radium

90 protons

Th

Thorium

86 protons

Rn

Radon

91 protons

Pa⁺

radioactive

82 protons

Pb

stable

92 protons

U⁺

radioactive

92 protons

U⁺

radioactive

lose 2 protons and 2 neutrons



a Hélium core (4He)

We get ?

lose 2 protons and 2 neutrons



a Hélium core (4He)

We get ?

82 protons

Pb

Lead

91 protons

Pa

Protactinium

92 protons

U

Uranium

92 protons

U

Uranium

Activity 5

(Front-back)

83 protons
126 neutrons

209

Bi



very slightly
radioactive α core
lose 2 protons and 2 neutrons



a Hélium core (4He)

We get ?

83 protons
127 neutrons

210

Bi



radioactive β - core

1 neutron transforms into 1 proton



We get ?

83 protons
129 neutrons

212

Bi



radioactive β - core

1 neutron transforms into 1 proton



We get ?

83 protons
131 neutrons

214

Bi



radioactive β - core

1 neutron transforms into 1 proton



We get ?

83 protons

Bi

Bismuth

83 protons

Bi

Bismuth

83 protons

Bi

Bismuth

83 protons

Bi

Bismuth

87 protons
136 neutrons



radioactive β^- core

1 neutron transforms into 1 proton



We get ?

87 protons
136 neutrons



radioactive β^- core

1 neutron se transforme en 1 proton



We get ?

85 protons
125 neutrons



radioactive β^+ core

1 proton transforms into 1 neutron



We get ?

85 protons
125 neutrons



radioactive β^+ core

1 proton transforms into 1 neutron



We get ?

87 protons

Fr

Francium

87 protons

Fr

Francium

85 protons

At

Astatine

85 protons

At

Astatine

91 protons
140 neutrons



radioactive α core

lose 2 protons and 2 neutrons



a Hélium core (4He)

We get ?

91 protons
143 neutrons



radioactive β - core

1 neutron transforms into 1 proton



We get ?

89 protons
138 neutrons



radioactive β - core

1 neutron transforms into 1 proton



We get ?

89 protons
139 neutrons



radioactive β - core

1 neutron transforms into 1 proton



We get ?

91 protons

Pa

Protactinium

91 protons

Pa

Protactinium

89 protons

Ac

Actinium

89 protons

Ac

Actinium

82 protons
124 neutrons

^{206}Pb

stable core

82 protons
124 neutrons

^{206}Pb

stable core

82 protons
125 neutrons

^{207}Pb

stable core

82 protons
126 neutrons

^{208}Pb

stable core

82 protons

Pb

Lead

82 protons

Pb

Lead

82 protons

Pb

Lead

82 protons

Pb

Lead

82 protons
128 neutrons



radioactive β- core

1 neutron transforms into 1 proton



We get ?

82 protons
129 neutrons



radioactive β- core

1 neutron transforms into 1 proton



We get ?

82 protons
130 neutrons



radioactive β- core

1 neutron transforms into 1 proton



We get ?

82 protons
132 neutrons



radioactive β- core

1 neutron transforms into 1 proton



We get ?

82 protons

Pb

Lead

82 protons

Pb

Lead

82 protons

Pb

Lead

82 protons

Pb

Lead

84 protons
126 neutrons



radioactive α core

lose 2 protons and 2 neutrons



a Hélium core (4He)

We get ?

84 protons
130 neutrons



radioactive α core

lose 2 protons and 2 neutrons



un noyau d'Hélium (4He)

On obtient ?

84 protons
132 neutrons



radioactive α core

lose 2 protons and 2 neutrons



a Hélium core (4He)

We get ?

84 protons
134 neutrons



radioactive α core

lose 2 protons and 2 neutrons



a Hélium core (4He)

We get ?

84 protons

Po

Polonium

84 protons

Po

Polonium

84 protons

Po

Polonium

84 protons

Po

Polonium

88 protons
135 neutrons



radioactive α core

lose 2 protons and 2 neutrons



a Hélium core (4He)

We get ?

88 protons
136 neutrons



radioactive α core

lose 2 protons and 2 neutrons



a Hélium core (4He)

We get ?

88 protons
138 neutrons



radioactive α core

lose 2 protons and 2 neutrons



a Hélium core (4He)

We get ?

88 protons
140 neutrons



radioactive β^- core

1 neutron transforms into 1 proton



We get ?

88 protons

Ra

Radium

88 protons

Ra

Radium

88 protons

Ra

Radium

88 protons

Ra

Radium

86 protons
132 neutrons



radioactive α core

lose 2 protons and 2 neutrons



a Hélium core (4He)

We get ?

86 protons
133 neutrons



radioactive α core

lose 2 protons and 2 neutrons



a Hélium core (4He)

We get ?

86 protons
134 neutrons



radioactive α core

lose 2 protons and 2 neutrons



a Hélium core (4He)

We get ?

86 protons
136 neutrons



radioactive α core

lose 2 protons and 2 neutrons



a Hélium core (4He)

We get ?

86 protons

Rn

Radon

86 protons

Rn

Radon

86 protons

Rn

Radon

86 protons

Rn

Radon

90 protons
140 neutrons



radioactive α core

lose 2 protons and 2 neutrons



a Hélium core (4He)

We get ?

90 protons
142 neutrons



radioactive α core

lose 2 protons and 2 neutrons



a Hélium core (4He)

We get ?

90 protons
141 neutrons



radioactive β^- core

1 neutron transforms into 1 proton



We get ?

90 protons
144 neutrons



radioactive β^- core

1 neutron transforms into 1 proton



We get ?

90 protons

Th

Thorium

90 protons

Th

Thorium

90 protons

Th

Thorium

90 protons

Th

Thorium

92 protons

142 neutrons



radioactive α core

lose 2 protons and 2 neutrons



a Helium core (4He)

We get ?

92 protons

143 neutrons



radioactive α core

lose 2 protons and 2 neutrons



a Helium core (4He)

We get ?

92 protons

146 neutrons



radioactive α core

lose 2 protons and 2 neutrons



a Helium core (4He)

We get ?

92 protons

146 neutrons



radioactive α core

lose 2 protons and 2 neutrons



a Helium core (4He)

We get ?

92 protons

U

Uranium

92 protons

U

Uranium

92 protons

U

Uranium

92 protons

U

Uranium

Alpha radioactivity : α

Emission of a **Helium 4He** nucleus:



*Named : **alpha α particle***

This is **alpha α radiation**

Alpha radioactivity : α

Emission of a **Helium 4He** nucleus:



*Named : **alpha α particle***

This is **alpha α radiation**

Alpha radioactivity : α

Emission of a **Helium 4He** nucleus:



*Named : **alpha α particle***

This is **alpha α radiation**

Alpha radioactivity : α

Emission of a **Helium 4He** nucleus:



*Named : **alpha α particle***

This is **alpha α radiation**

Alpha radioactivity : α

Emission of a **Helium 4He** nucleus:



Named : alpha α particle

This is **alpha α radiation**

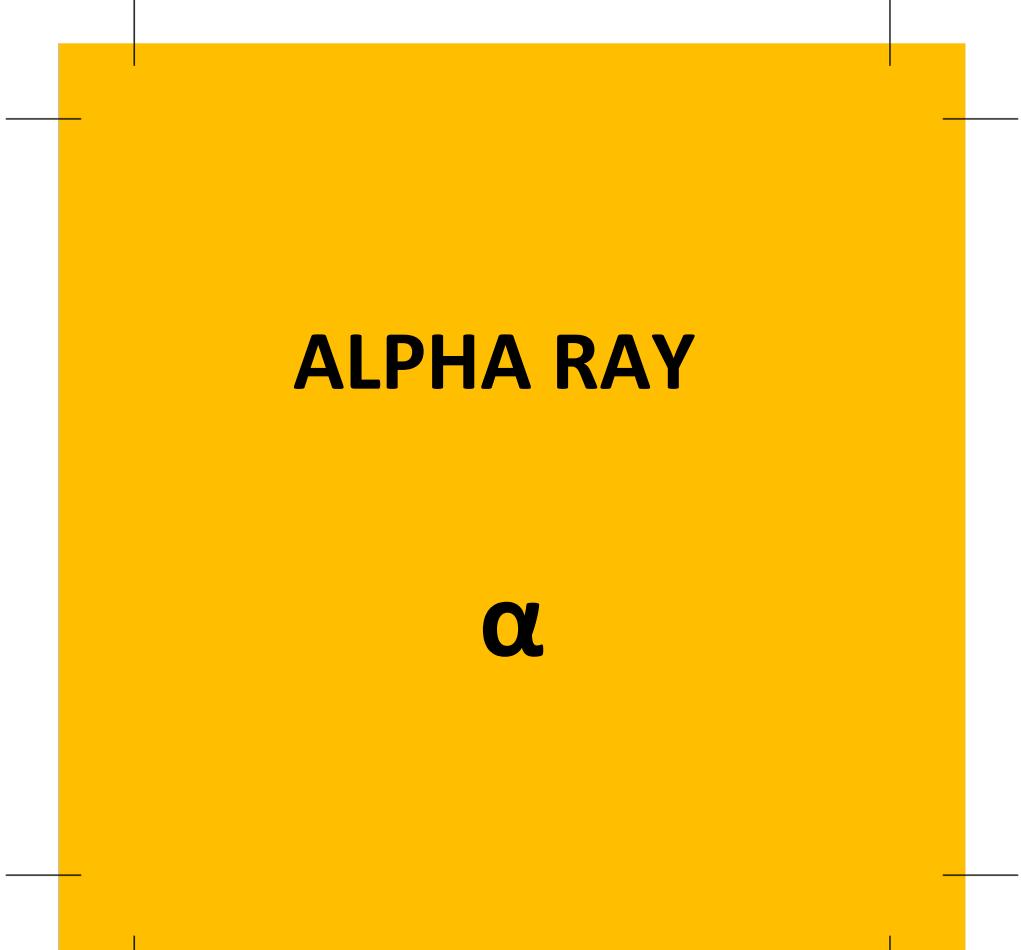
Alpha radioactivity : α

Emission of a **Helium 4He** nucleus:



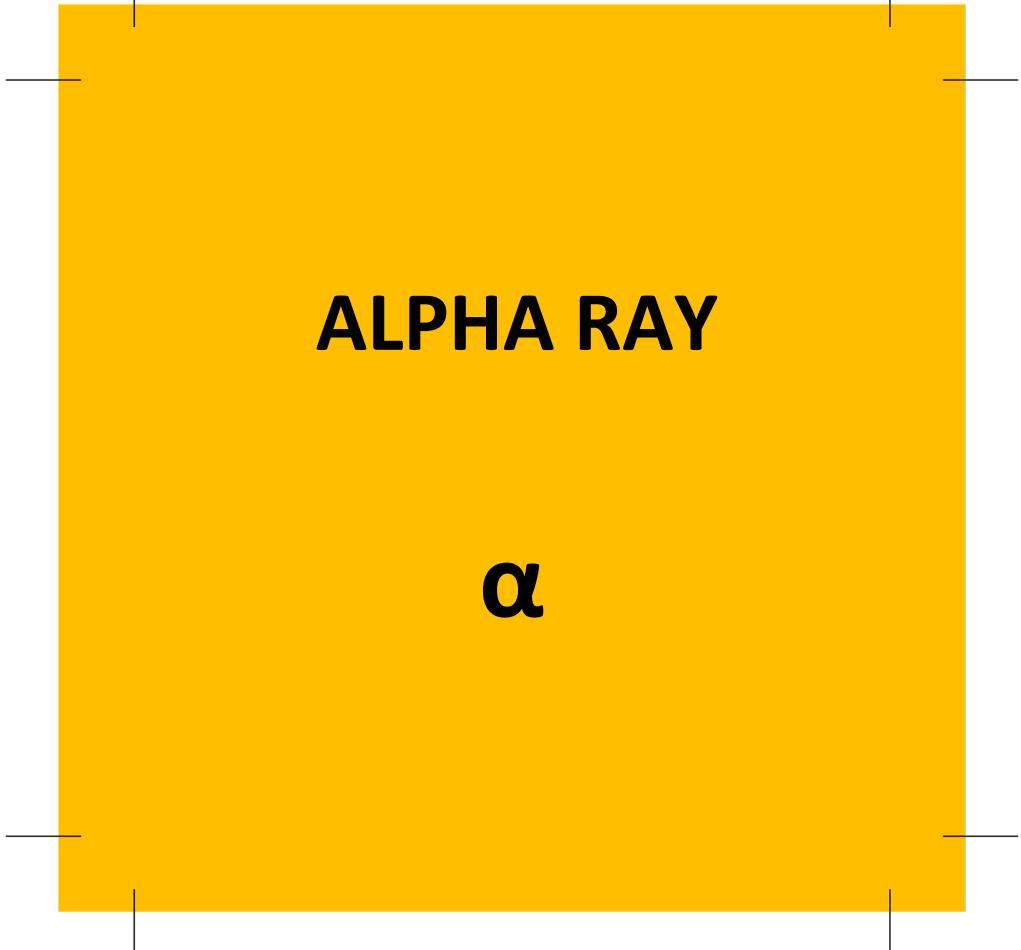
Named : alpha α particle

This is **alpha α radiation**



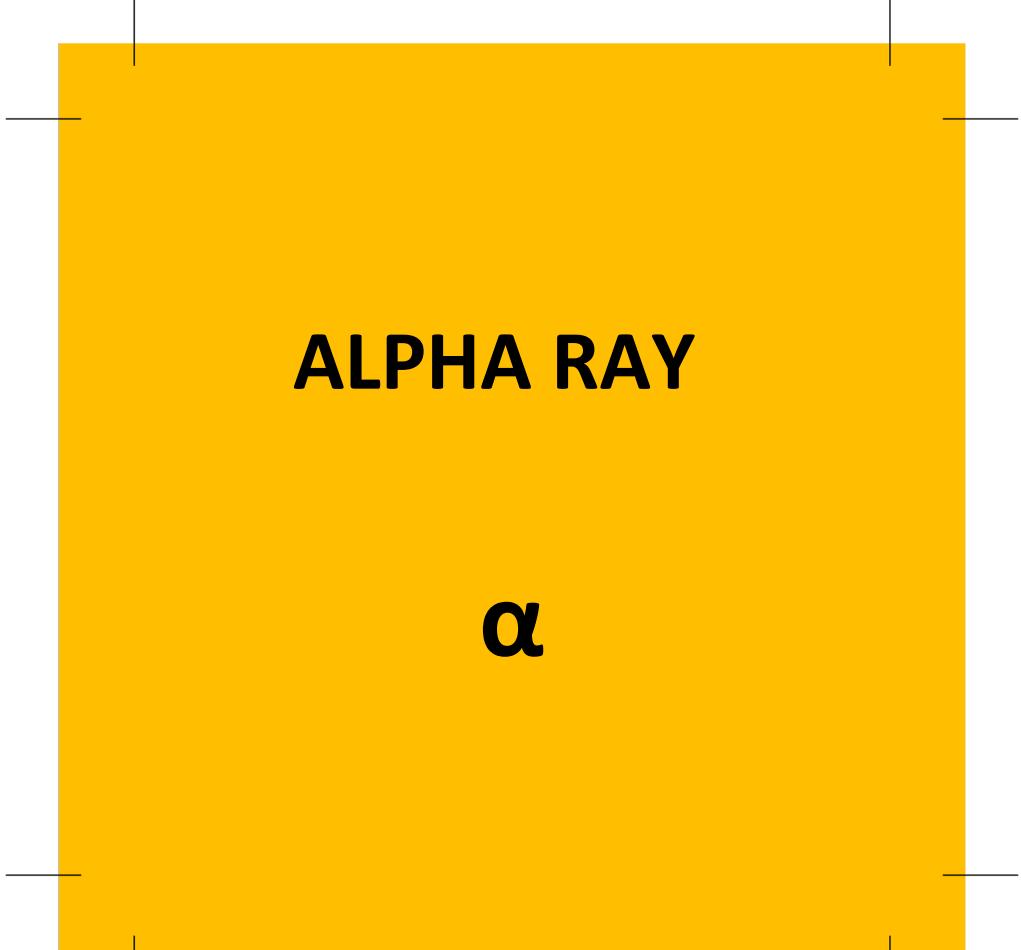
ALPHA RAY

α



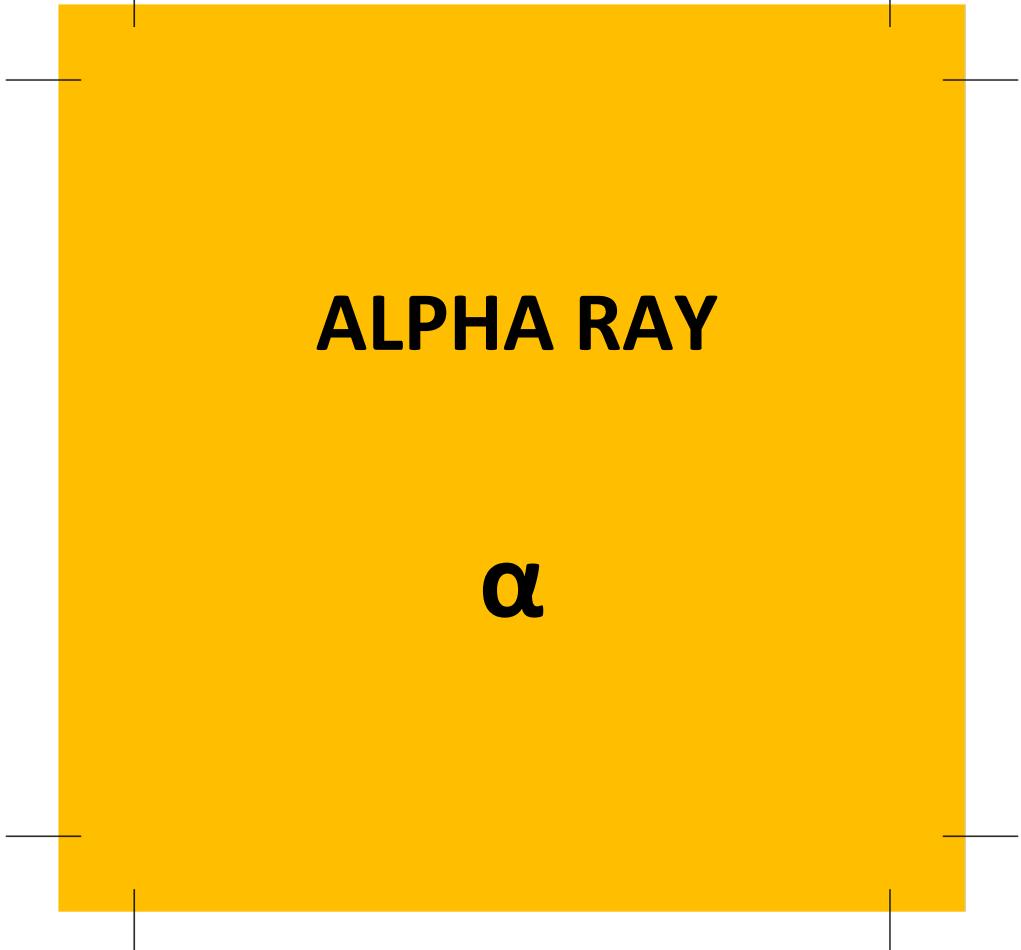
ALPHA RAY

α



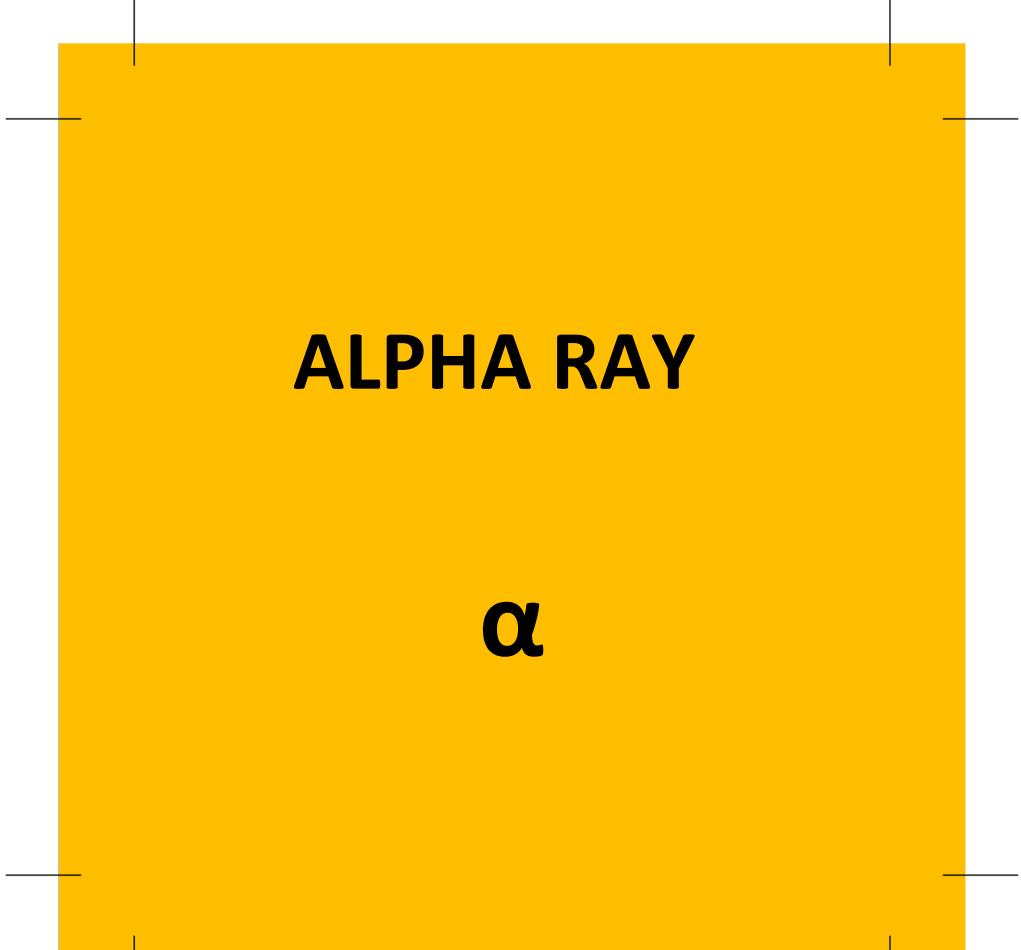
ALPHA RAY

α



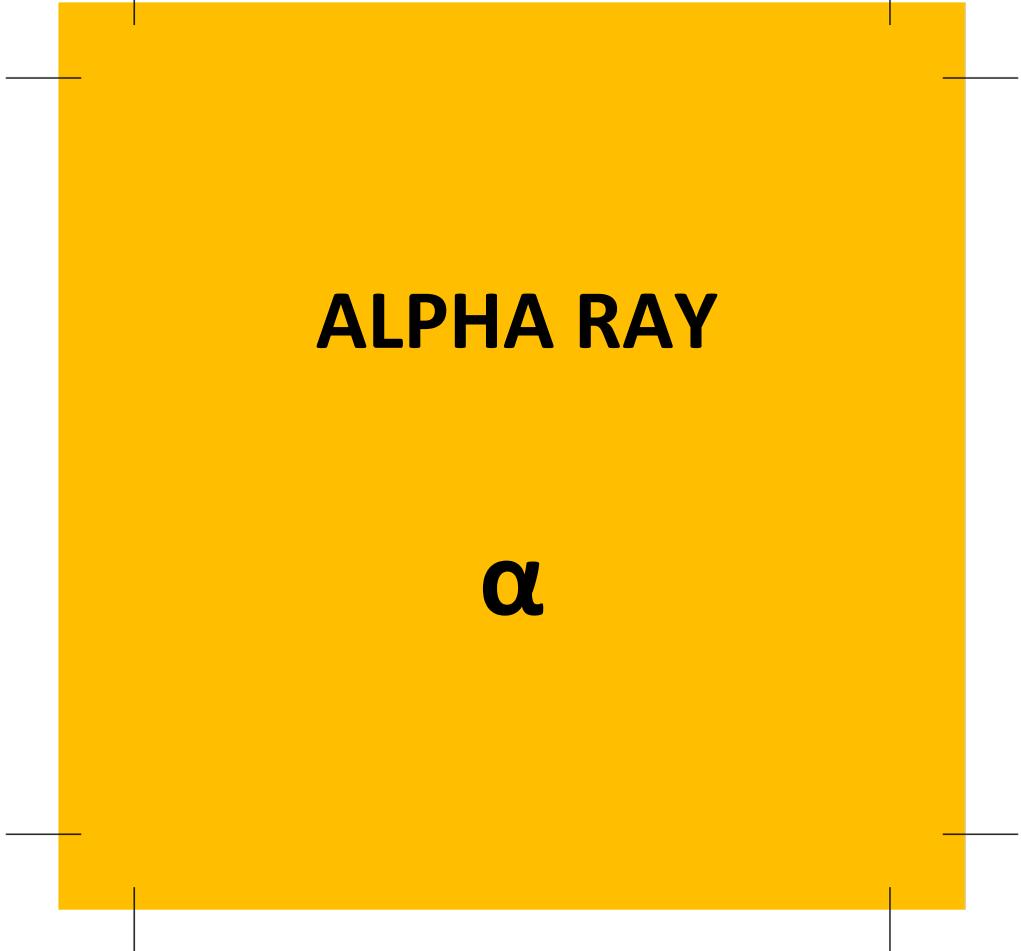
ALPHA RAY

α



ALPHA RAY

α



ALPHA RAY

α

Bêta plus radioactivity : β^+

A proton transforms into a neutron and
a positon (an anti-electron) (e^+) is created
and is ejected from the nucleus :

This is β^+ radiation

Bêta minus radioactivity : β^-

A neutron transforms into a proton and
an electron (e^-) is created and is ejected
from the nucleus :

This is β^- radiation

Bêta plus radioactivity : β^+

A proton transforms into a neutron and
a positon (an anti-electron) (e^+) is created
and is ejected from the nucleus :

This is β^+ radiation

Bêta minus radioactivity : β^-

A neutron transforms into a proton and
an electron (e^-) is created and is ejected
from the nucleus :

This is β^- radiation

Bêta plus radioactivity : β^+

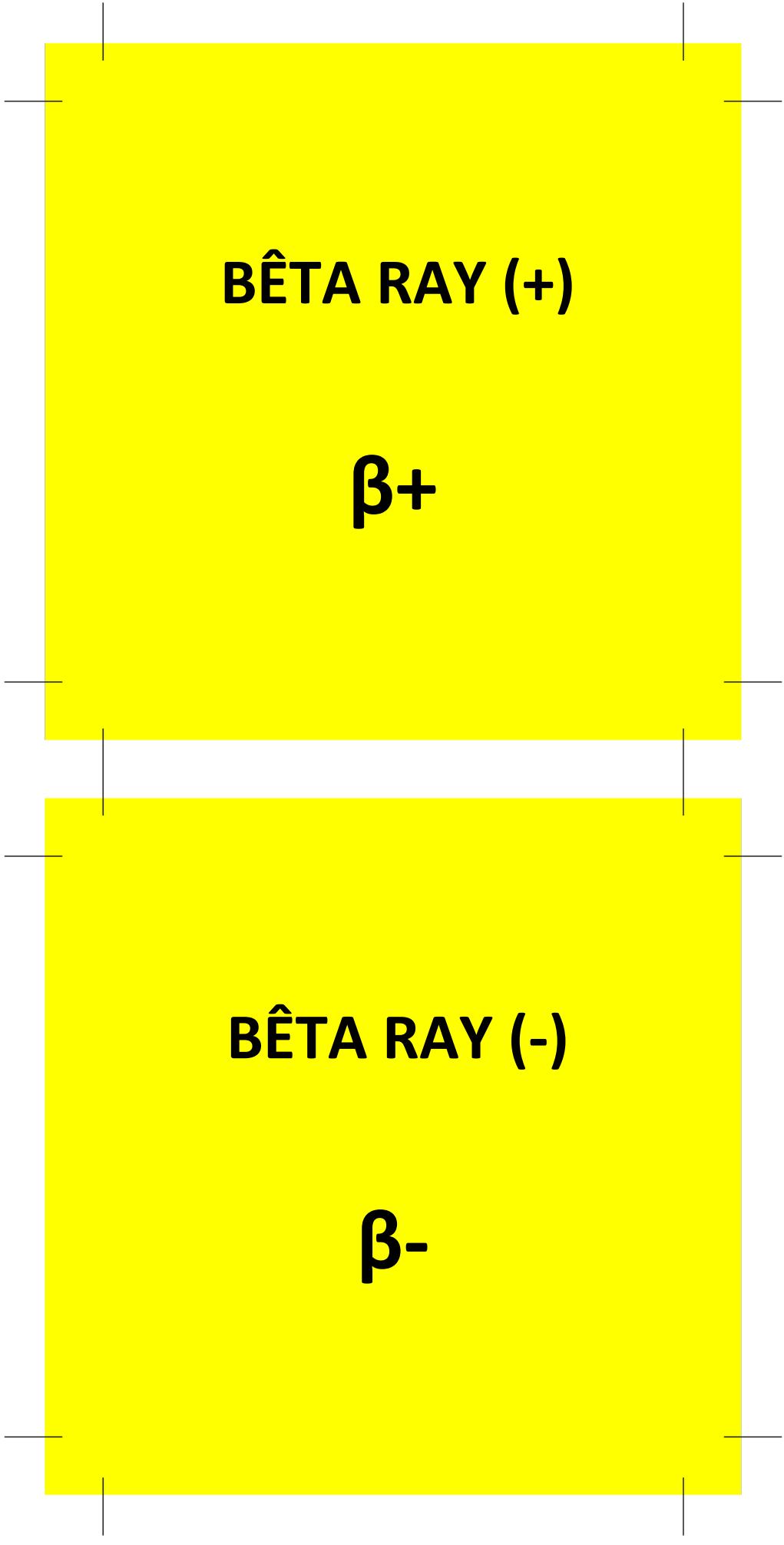
A proton transforms into a neutron and
a positon (an anti-electron) (e^+) is created
and is ejected from the nucleus :

This is β^+ radiation

Bêta minus radioactivity : β^-

A neutron transforms into a proton and
an electron (e^-) is created and is ejected
from the nucleus :

This is β^- radiation

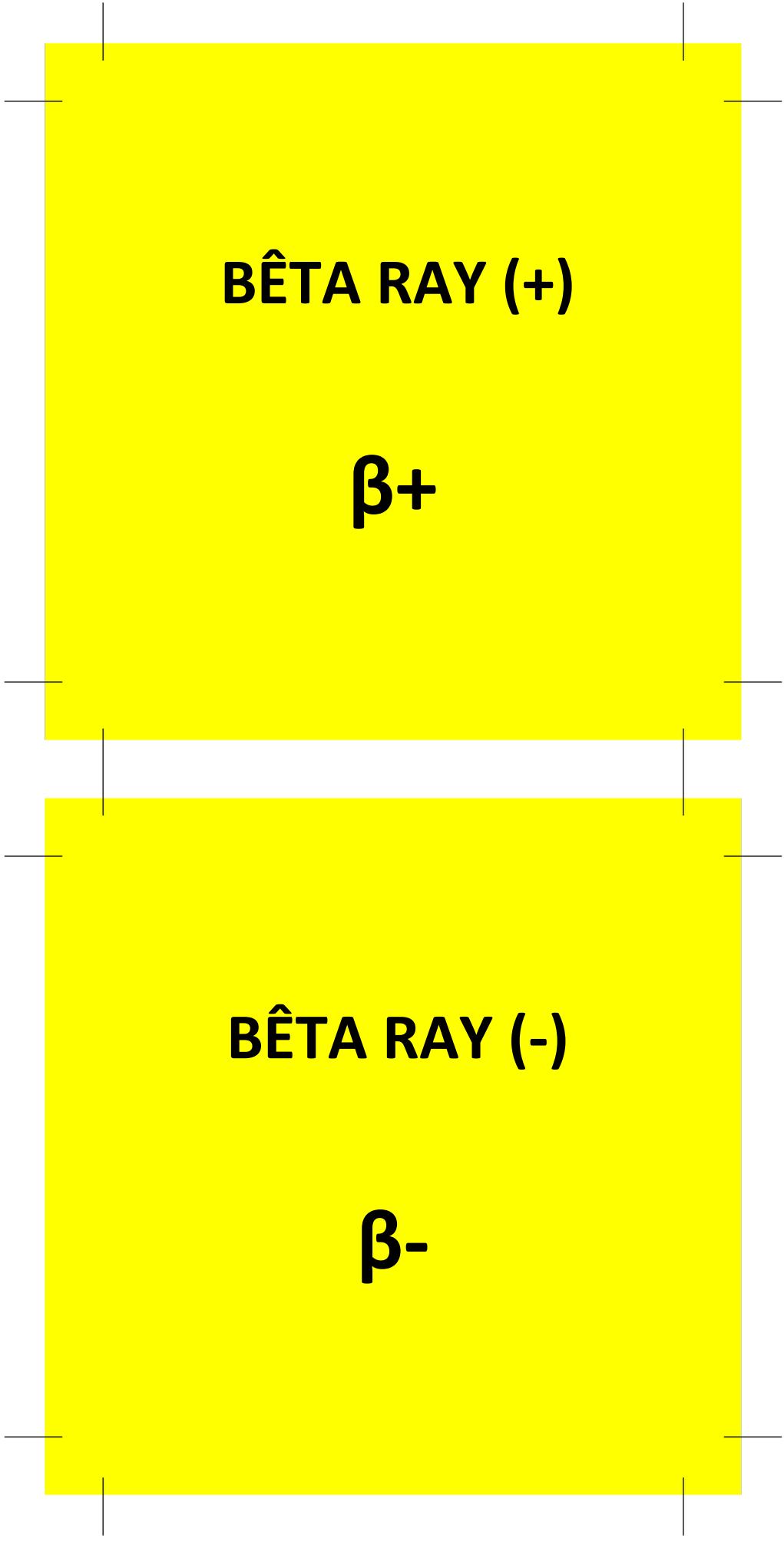


BÊTA RAY (+)

β^+

BÊTA RAY (-)

β^-

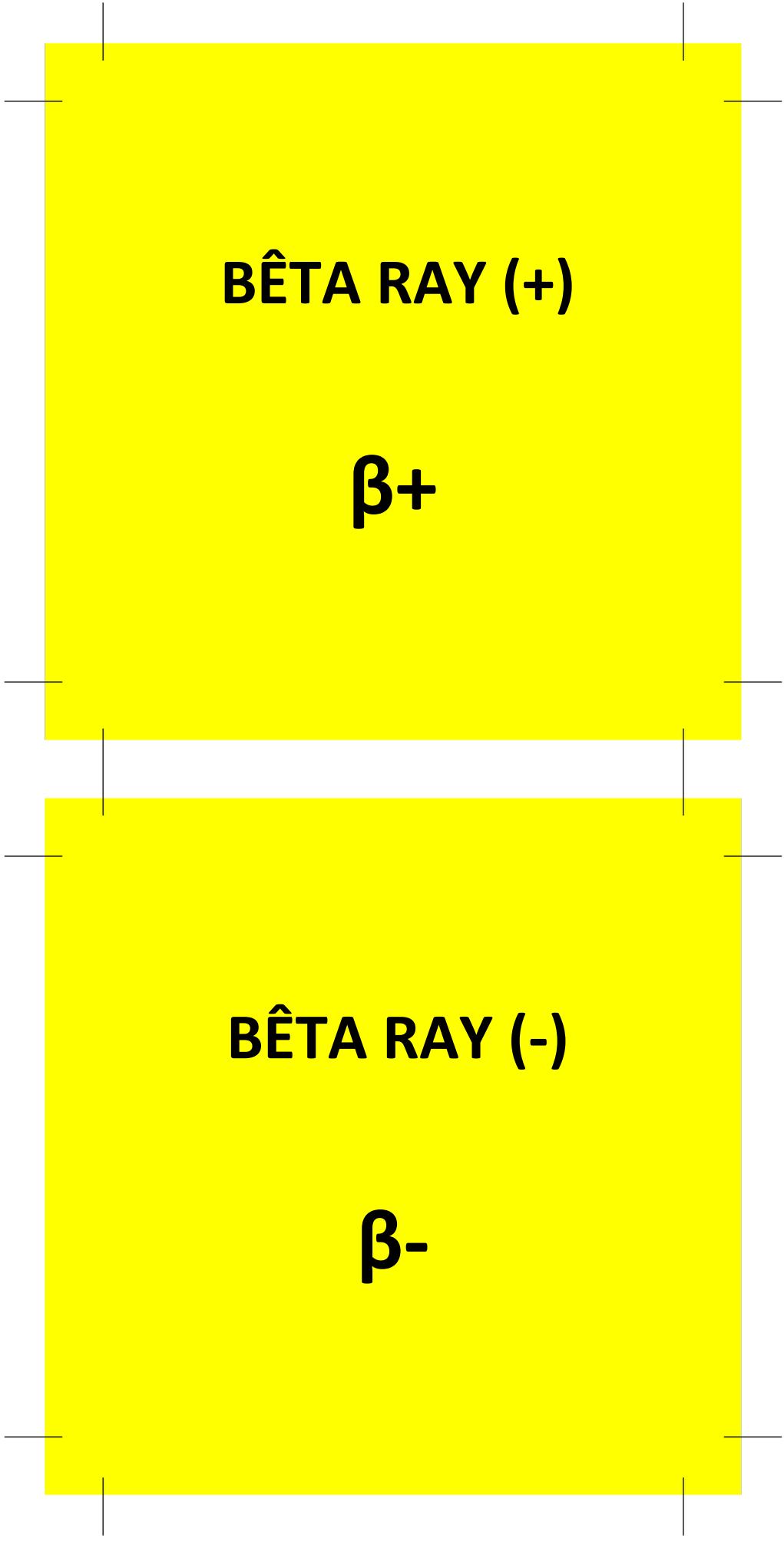


BÊTA RAY (+)

β^+

BÊTA RAY (-)

β^-



BÊTA RAY (+)

β^+

BÊTA RAY (-)

β^-