

# Réseaux de Bravais

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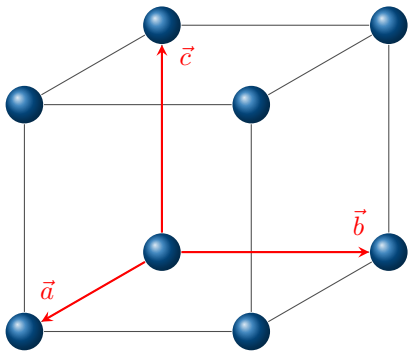
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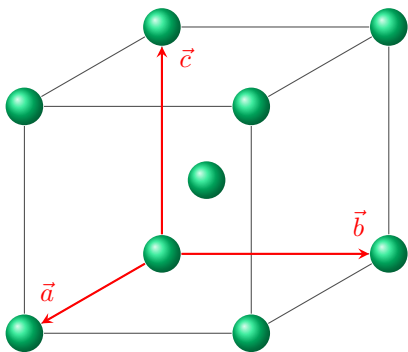
# 1 Système cubique

- $a = b = c$
- $\alpha = \beta = \gamma = 90^\circ$

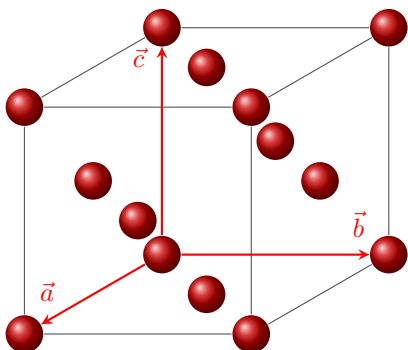
## 1.1 Réseau cubique primitif



## 1.2 Réseau cubique centré



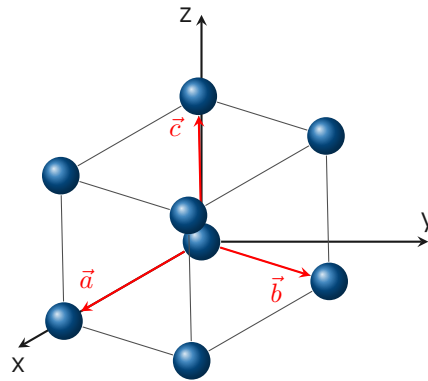
## 1.3 Réseau cubique faces centrées



# 2 Système rhomboédrique

- $a = b = c$
- $\alpha = \beta = \gamma \neq 90^\circ$

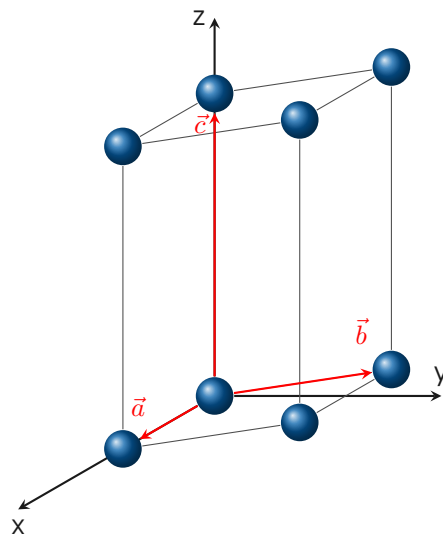
## 2.1 Réseau rhomboédrique primitif



# 3 Système hexagonal

- $a = b \neq c$
- $\alpha = \beta = 90^\circ, \gamma = 120^\circ$

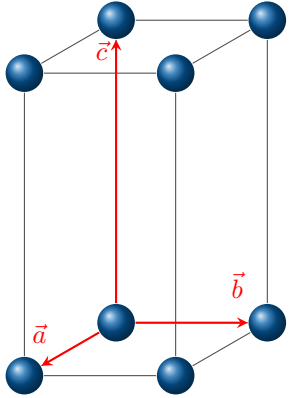
## 3.1 Réseau hexagonal primitif



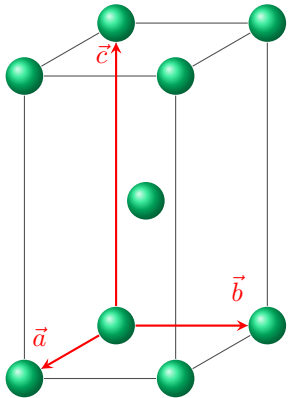
## 4 Système quadratique

- $a = b \neq c$
- $\alpha = \beta = \gamma = 90^\circ$

### 4.1 Réseau quadratique primitif



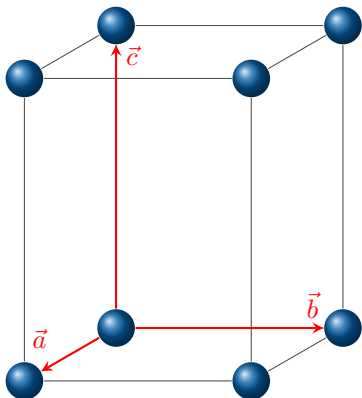
### 4.2 Réseau quadratique centré



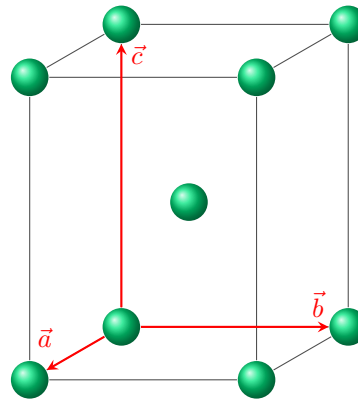
## 5 Système orthorhombique

- $a \neq b \neq c$
- $\alpha = \beta = \gamma = 90^\circ$

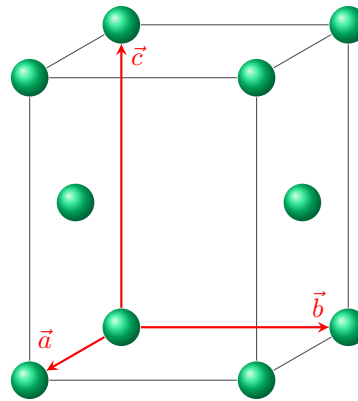
### 5.1 Réseau orthorhombique primitif



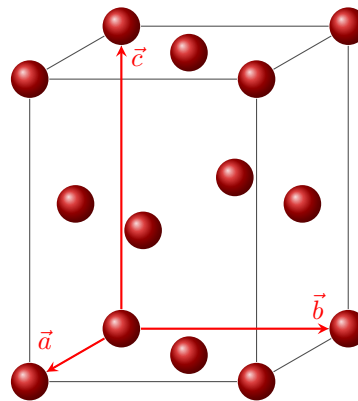
### 5.2 Réseau orthorhombique centré



### 5.3 Réseau orthorhombique base centrée



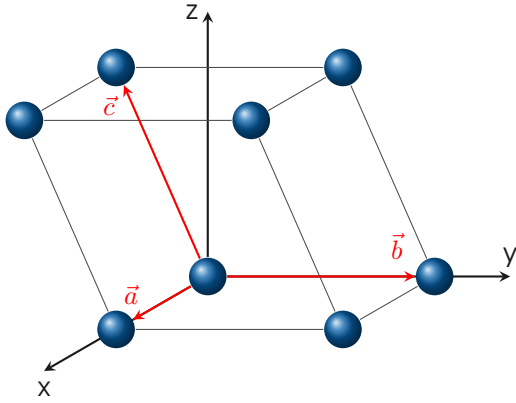
### 5.4 Réseau orthorhombique faces centrées



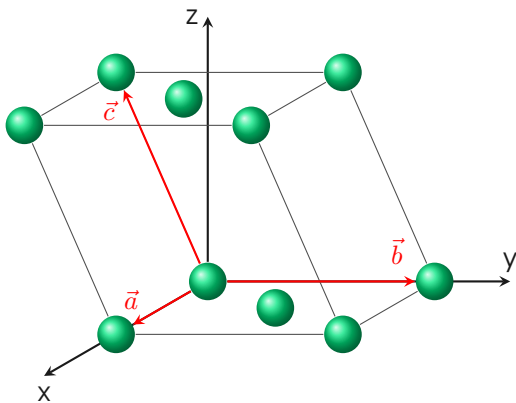
## 6 Système monoclinique

- $a \neq b \neq c$
- $\alpha = \gamma = 90^\circ, \beta \neq 90^\circ$

### 6.1 Réseau monoclinique primitif



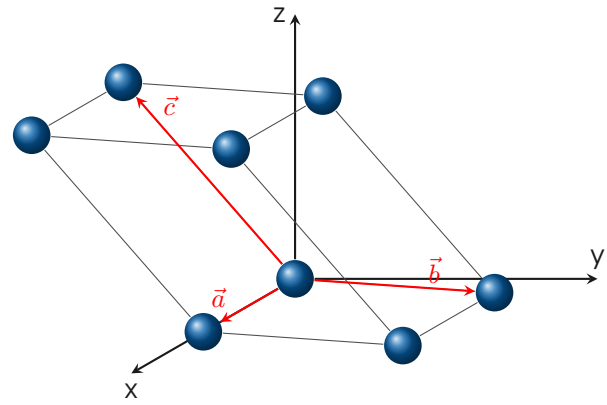
### 6.2 Réseau monoclinique base centrée



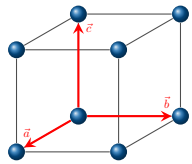
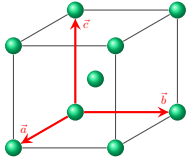
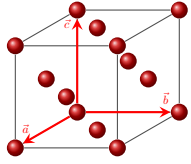
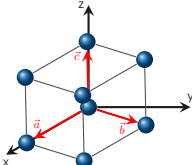
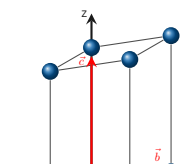
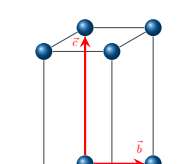
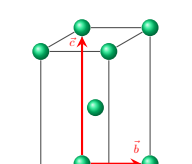
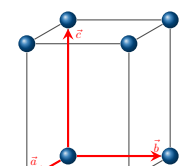
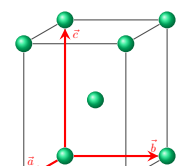
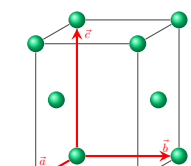
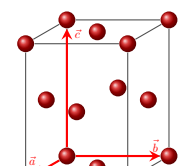
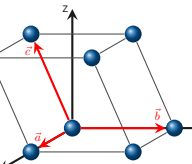
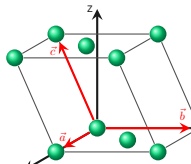
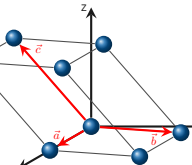
## 7 Système triclinique

- $a \neq b \neq c$
- $\alpha \neq \beta \neq \gamma$

### 7.1 Réseau triclinique primitif



## 8 Tableau récapitulatif

Multiplicité	m = 1			m = 2		m = 4
Type de réseau	Primitif (P)	Centré (I)	Bases centrées (C)		Faces centrées (F)	
Cubique $a = b = c$ $\alpha = \beta = \gamma$						
Rhomboédrique $a = b = c$ $\alpha = \beta = \gamma \neq 90^\circ$						
Hexagonal $a = b \neq c$ $\alpha = \beta = 90^\circ$ $\gamma = 120^\circ$						
Quadratique $a = b \neq c$ $\alpha = \beta = \gamma = 90^\circ$						
Orthorhombique $a \neq b \neq c$ $\alpha = \beta = \gamma = 90^\circ$						
Monoclinique $a \neq b \neq c$ $\alpha = \gamma = 90^\circ$ $\beta \neq 90^\circ$						
Triclinique $a \neq b \neq c$ $\alpha \neq \beta \neq \gamma \neq 90^\circ$						

## 9 Code source des structures

```
1 %
2 % tikz
3 %
4 \usepackage{tikz}
5 \usetikzlibrary{3d}
6
7 %
8 % couleurs
9 %
10 \definecolor{bleuP}{rgb}{0.02, 0.38, 0.67}
11 \definecolor{vertI}{rgb}{0.0, 0.90, 0.50}
12 \definecolor{redF}{rgb}{0.81, 0.00, 0.00}
13
14 %
15 % orientation de la vue
16 %
17 \tikzstyle{view} = [x={(-0.866cm,-0.5cm)},y={(1cm,0cm)},z={(0cm,1cm)}]
18 \pgfmathsetmacro{\report}{0.7}
19
20 % styles pourtikz
21 \tikzstyle{maille} = [color=black!70, thin]
22 \tikzstyle{vecteur} = [-stealth, color=red, thick]
23 \tikzstyle{axe} = [-stealth, color=black!90, thick]
24 \tikzstyle{noeud} = [circle, scale=1.5]
25 \tikzstyle{noeudP} = [noeud, ball color=bleuP]
26 \tikzstyle{noeudI} = [noeud, ball color=vertI]
27 \tikzstyle{noeudF} = [noeud, ball color=redF]
28
29 %
30 % Systeme cubique
31 %
32
33 % Reseau cubique primitif
34
35 \begin{tikzpicture}[view]
36 \node[noeudP] at ( 0.000*\report, 0.000, 0.000) (c0) {};
37 \node[noeudP] at ( 3.000*\report, 0.000, 0.000) (c1) {};
38 \node[noeudP] at ( 3.000*\report, 3.000, 0.000) (c2) {};
39 \node[noeudP] at ( 3.000*\report, 0.000, 3.000) (c3) {};
40 \node[noeudP] at ( 3.000*\report, 3.000, 3.000) (c4) {};
41 \node[noeudP] at ( 0.000*\report, 3.000, 0.000) (c5) {};
42 \node[noeudP] at ( 0.000*\report, 0.000, 3.000) (c6) {};
43 \node[noeudP] at ( 0.000*\report, 3.000, 3.000) (c7) {};
44 \draw[maille] (c0) -- (c1);
45 \draw[maille] (c0) -- (c6);
46 \draw[maille] (c3) -- (c1);
47 \draw[maille] (c3) -- (c6);
48 \draw[maille] (c0) -- (c5);
49 \draw[maille] (c1) -- (c2);
50 \draw[maille] (c3) -- (c4);
51 \draw[maille] (c6) -- (c7);
52 \draw[maille] (c2) -- (c5);
53 \draw[maille] (c5) -- (c7);
54 \draw[maille] (c7) -- (c4);
55 \draw[maille] (c4) -- (c2);
56 \draw[vecteur] (c0) -- (c1) \node[above, xshift=3mm, yshift=3mm] {$\vec{a}$};
57 \draw[vecteur] (c0) -- (c5) \node[above, xshift=-4mm, yshift=1mm] {$\vec{b}$};
58 \draw[vecteur] (c0) -- (c6) \node[right, xshift=1mm, yshift=-4mm] {$\vec{c}$};
59 \end{tikzpicture}
60
61 % Reseau cubique centre
62
63 \begin{tikzpicture}[view]
```

```

64 \node[noeudI] at ( 0.000*\report, 0.000, 0.000) (c0) {} ;
65 \node[noeudI] at ( 3.000*\report, 0.000, 0.000) (c1) {} ;
66 \node[noeudI] at ( 3.000*\report, 3.000, 0.000) (c2) {} ;
67 \node[noeudI] at ( 3.000*\report, 0.000, 3.000) (c3) {} ;
68 \node[noeudI] at ( 3.000*\report, 3.000, 3.000) (c4) {} ;
69 \node[noeudI] at ( 0.000*\report, 3.000, 0.000) (c5) {} ;
70 \node[noeudI] at ( 0.000*\report, 0.000, 3.000) (c6) {} ;
71 \node[noeudI] at ( 0.000*\report, 3.000, 3.000) (c7) {} ;
72 \node[noeudI] at ( 1.500*\report, 1.500, 1.500) (c14) {} ;
73 \draw[maille] (c0) -- (c1);
74 \draw[maille] (c0) -- (c6);
75 \draw[maille] (c3) -- (c1);
76 \draw[maille] (c3) -- (c6);
77 \draw[maille] (c0) -- (c5);
78 \draw[maille] (c1) -- (c2);
79 \draw[maille] (c3) -- (c4);
80 \draw[maille] (c6) -- (c7);
81 \draw[maille] (c2) -- (c5);
82 \draw[maille] (c5) -- (c7);
83 \draw[maille] (c7) -- (c4);
84 \draw[maille] (c4) -- (c2);
85 \draw[vecteur] (c0) -- (c1) node[above, xshift=3mm, yshift=3mm] {$\vec{a}$};
86 \draw[vecteur] (c0) -- (c5) node[above, xshift=-4mm, yshift=1mm] {$\vec{b}$};
87 \draw[vecteur] (c0) -- (c6) node[right, xshift=1mm, yshift=-4mm] {$\vec{c}$};
88 \end{tikzpicture}
89
90 % Reseau cubique faces centrees
91
92 \begin{tikzpicture}[view]
93 \node[noeudF] at ( 0.000*\report, 0.000, 0.000) (c0) {} ;
94 \node[noeudF] at ( 3.000*\report, 0.000, 0.000) (c1) {} ;
95 \node[noeudF] at ( 3.000*\report, 3.000, 0.000) (c2) {} ;
96 \node[noeudF] at ( 3.000*\report, 0.000, 3.000) (c3) {} ;
97 \node[noeudF] at ( 3.000*\report, 3.000, 3.000) (c4) {} ;
98 \node[noeudF] at ( 0.000*\report, 3.000, 0.000) (c5) {} ;
99 \node[noeudF] at ( 0.000*\report, 0.000, 3.000) (c6) {} ;
100 \node[noeudF] at ( 0.000*\report, 3.000, 3.000) (c7) {} ;
101 \node[noeudF] at ( 1.500*\report, 1.500, 0.000) (c8) {} ;
102 \node[noeudF] at ( 1.500*\report, 1.500, 3.000) (c9) {} ;
103 \node[noeudF] at ( 3.000*\report, 1.500, 1.500) (c10) {} ;
104 \node[noeudF] at ( 0.000*\report, 1.500, 1.500) (c11) {} ;
105 \node[noeudF] at ( 1.500*\report, 0.000, 1.500) (c12) {} ;
106 \node[noeudF] at ( 1.500*\report, 3.000, 1.500) (c13) {} ;
107 \draw[maille] (c0) -- (c1);
108 \draw[maille] (c0) -- (c6);
109 \draw[maille] (c3) -- (c1);
110 \draw[maille] (c3) -- (c6);
111 \draw[maille] (c0) -- (c5);
112 \draw[maille] (c1) -- (c2);
113 \draw[maille] (c3) -- (c4);
114 \draw[maille] (c6) -- (c7);
115 \draw[maille] (c2) -- (c5);
116 \draw[maille] (c5) -- (c7);
117 \draw[maille] (c7) -- (c4);
118 \draw[maille] (c4) -- (c2);
119 \draw[vecteur] (c0) -- (c1) node[above, xshift=3mm, yshift=3mm] {$\vec{a}$};
120 \draw[vecteur] (c0) -- (c5) node[above, xshift=-4mm, yshift=1mm] {$\vec{b}$};
121 \draw[vecteur] (c0) -- (c6) node[left, xshift=-1mm, yshift=-4mm] {$\vec{c}$};
122 \end{tikzpicture}
123
124 %
125 % Systeme rhomboedrique
126 %
127
128 % Reseau rhomboedrique primitif
129

```

```

130 \begin{tikzpicture}[view]
131   \draw[axe] (c0) -- ++ (4*\report,0,0) node[below] {x};
132   \draw[axe] (c0) -- ++ (0,3,0) node[above] {y};
133   \draw[axe] (c0) -- ++ (0,0,3) node[left] {z};
134
135   \node[noeudP] at ( 0.000*\report, 0.000, 0.000) (c0) {};
136   \node[noeudP] at ( 3.000*\report, 0.000, 0.000) (c1) {};
137   \node[noeudP] at ( 4.500*\report, 2.598, 0.000) (c2) {};
138   \node[noeudP] at ( 4.500*\report, 0.867, 2.448) (c3) {};
139   \node[noeudP] at ( 1.500*\report, 2.598, 0.000) (c5) {};
140   \node[noeudP] at ( 1.500*\report, 0.867, 2.448) (c6) {};
141   \node[noeudP] at ( 3.000*\report, 3.465, 2.448) (c7) {};
142
143   \draw[maille] (c0) -- (c1);
144   \draw[maille] (c0) -- (c5);
145   \draw[maille] (c0) -- (c6);
146   \draw[vecteur] (c0) -- (c1) node[above, xshift=3mm, yshift=3mm] {$\vec{a}$};
147   \draw[vecteur] (c0) -- (c5) node[below, xshift=-7mm, yshift=2mm] {$\vec{b}$};
148   \draw[vecteur] (c0) -- (c6) node[left, yshift=-4mm, xshift=-1mm] {$\vec{c}$};
149
150   \node[noeudP] at ( 6.000*\report, 3.465, 2.448) (c4) {};
151
152   \draw[maille] (c2) -- (c5);
153   \draw[maille] (c2) -- (c1);
154   \draw[maille] (c3) -- (c4);
155   \draw[maille] (c4) -- (c7);
156   \draw[maille] (c7) -- (c6);
157   \draw[maille] (c6) -- (c3);
158   \draw[maille] (c1) -- (c3);
159   \draw[maille] (c2) -- (c4);
160   \draw[maille] (c5) -- (c7);
161 \end{tikzpicture}
162
163 %
164 % Systeme hexagonal
165 %
166
167 % Reseau hexagonal primitif
168
169 \begin{tikzpicture}[view]
170   \draw[axe] (c0) -- ++ (3,0,0) node[below] {x};
171   \draw[axe] (c0) -- ++ (0,3,0) node[above] {y};
172   \draw[axe] (c0) -- ++ (0,0,5) node[left] {z};
173
174   \node[noeudP] at ( 0.000*\report, 0.000, 0.000) (c0) {};
175   \node[noeudP] at ( 2.000*\report, 0.000, 0.000) (c1) {};
176   \node[noeudP] at ( 1.000*\report, 1.732, 0.000) (c2) {};
177   \node[noeudP] at ( 2.000*\report, 0.000, 4.000) (c3) {};
178   \node[noeudP] at ( 1.000*\report, 1.732, 4.000) (c4) {};
179   \node[noeudP] at ( -1.000*\report, 1.732, 0.000) (c5) {};
180   \node[noeudP] at ( 0.000*\report, 0.000, 4.000) (c6) {};
181   \node[noeudP] at ( -1.000*\report, 1.732, 4.000) (c7) {};
182
183   \draw[maille] (c0) -- (c1);
184   \draw[maille] (c2) -- (c5);
185   \draw[maille] (c0) -- (c5);
186   \draw[maille] (c2) -- (c1);
187   \draw[maille] (c3) -- (c4);
188   \draw[maille] (c4) -- (c7);
189   \draw[maille] (c7) -- (c6);
190   \draw[maille] (c6) -- (c3);
191   \draw[maille] (c0) -- (c6);
192   \draw[maille] (c1) -- (c3);
193   \draw[maille] (c2) -- (c4);
194   \draw[maille] (c5) -- (c7);
195   \draw[vecteur] (c0) -- (c1) node[above, xshift=2mm, yshift=3mm] {$\vec{a}$};

```



```

196     \draw[vecteur] (c0) -- (c5) node[above, xshift=-4mm, yshift=2mm] {$\vec{b}$};
197     \draw[vecteur] (c0) -- (c6) node[right, yshift=-4mm, xshift=-4mm] {$\vec{c}$};
198 \end{tikzpicture}
199
200 %
201 % Systeme quadratique
202 %
203
204 % Reseau quadratique primitif
205
206 \begin{tikzpicture}[view]
207     \node[noeudP] at ( 0.000*\report, 0.000, 0.000) (c0) {};
208     \node[noeudP] at ( 2.000*\report, 0.000, 0.000) (c2) {};
209     \node[noeudP] at ( 2.000*\report, 2.000, 0.000) (c3) {};
210     \node[noeudP] at ( 2.000*\report, 0.000, 4.000) (c4) {};
211     \node[noeudP] at ( 2.000*\report, 2.000, 4.000) (c5) {};
212     \node[noeudP] at ( 0.000*\report, 2.000, 0.000) (c6) {};
213     \node[noeudP] at ( 0.000*\report, 0.000, 4.000) (c7) {};
214     \node[noeudP] at ( 0.000*\report, 2.000, 4.000) (c8) {};
215
216     \draw[maille] (c0) -- (c2);
217     \draw[maille] (c2) -- (c3);
218     \draw[maille] (c3) -- (c6);
219     \draw[maille] (c6) -- (c0);
220     \draw[maille] (c0) -- (c7);
221     \draw[maille] (c2) -- (c4);
222     \draw[maille] (c3) -- (c5);
223     \draw[maille] (c6) -- (c8);
224     \draw[maille] (c7) -- (c4);
225     \draw[maille] (c4) -- (c5);
226     \draw[maille] (c8) -- (c5);
227     \draw[maille] (c8) -- (c7);
228     \draw[vecteur] (c0) -- (c2) node[above, xshift=2mm, yshift=3mm] {$\vec{a}$};
229     \draw[vecteur] (c0) -- (c6) node[above, xshift=-4mm, yshift=2mm] {$\vec{b}$};
230     \draw[vecteur] (c0) -- (c7) node[right, yshift=-4mm, xshift=-4mm] {$\vec{c}$};
231 \end{tikzpicture}
232
233 % Reseau quadratique centre
234
235 \begin{tikzpicture}[view]
236     \node[noeudI] at ( 0.000*\report, 0.000, 0.000) (c0) {};
237     \node[noeudI] at ( 1.000*\report, 1.000, 2.000) (c1) {};
238     \node[noeudI] at ( 2.000*\report, 0.000, 0.000) (c2) {};
239     \node[noeudI] at ( 2.000*\report, 2.000, 0.000) (c3) {};
240     \node[noeudI] at ( 2.000*\report, 0.000, 4.000) (c4) {};
241     \node[noeudI] at ( 2.000*\report, 2.000, 4.000) (c5) {};
242     \node[noeudI] at ( 0.000*\report, 2.000, 0.000) (c6) {};
243     \node[noeudI] at ( 0.000*\report, 0.000, 4.000) (c7) {};
244     \node[noeudI] at ( 0.000*\report, 2.000, 4.000) (c8) {};
245
246     \draw[maille] (c0) -- (c2);
247     \draw[maille] (c2) -- (c3);
248     \draw[maille] (c3) -- (c6);
249     \draw[maille] (c6) -- (c0);
250     \draw[maille] (c0) -- (c7);
251     \draw[maille] (c2) -- (c4);
252     \draw[maille] (c3) -- (c5);
253     \draw[maille] (c6) -- (c8);
254     \draw[maille] (c7) -- (c4);
255     \draw[maille] (c4) -- (c5);
256     \draw[maille] (c8) -- (c5);
257     \draw[maille] (c8) -- (c7);
258     \draw[vecteur] (c0) -- (c2) node[above, xshift=2mm, yshift=3mm] {$\vec{a}$};
259     \draw[vecteur] (c0) -- (c6) node[above, xshift=-4mm, yshift=2mm] {$\vec{b}$};
260     \draw[vecteur] (c0) -- (c7) node[right, yshift=-4mm, xshift=-4mm] {$\vec{c}$};
261 \end{tikzpicture}

```

```

262
263 %
264 % Systeme orthorhombique
265 %
266
267 % Reseau orthorhombique primitif
268
269 \begin{tikzpicture}[view]
270 \node[noeudP] at ( 0.000*\report, 0.000, 0.000) (c0) {} ;
271 \node[noeudP] at ( 2.000*\report, 0.000, 0.000) (c5) {} ;
272 \node[noeudP] at ( 2.000*\report, 3.000, 0.000) (c6) {} ;
273 \node[noeudP] at ( 2.000*\report, 0.000, 4.000) (c7) {} ;
274 \node[noeudP] at ( 2.000*\report, 3.000, 4.000) (c8) {} ;
275 \node[noeudP] at ( 0.000*\report, 3.000, 0.000) (c9) {} ;
276 \node[noeudP] at ( 0.000*\report, 0.000, 4.000) (c10) {} ;
277 \node[noeudP] at ( 0.000*\report, 3.000, 4.000) (c11) {} ;
278
279 \draw[maille] (c0) -- (c5);
280 \draw[maille] (c0) -- (c9);
281 \draw[maille] (c5) -- (c6);
282 \draw[maille] (c6) -- (c9);
283 \draw[maille] (c0) -- (c10);
284 \draw[maille] (c5) -- (c7);
285 \draw[maille] (c9) -- (c11);
286 \draw[maille] (c6) -- (c8);
287 \draw[maille] (c7) -- (c10);
288 \draw[maille] (c10) -- (c11);
289 \draw[maille] (c11) -- (c8);
290 \draw[maille] (c8) -- (c7);
291 \draw[vecteur] (c0) -- (c5) node[above, xshift=2mm, yshift=3mm] {$\vec{a}$};
292 \draw[vecteur] (c0) -- (c9) node[above, xshift=-4mm] {$\vec{b}$};
293 \draw[vecteur] (c0) -- (c10) node[right, yshift=-4mm] {$\vec{c}$};
294 \end{tikzpicture}
295
296 % Reseau orthorhombique centre
297
298 \begin{tikzpicture}[view]
299 \node[noeudI] at ( 0.000*\report, 0.000, 0.000) (c0) {} ;
300 \node[noeudI] at ( 2.000*\report, 0.000, 0.000) (c5) {} ;
301 \node[noeudI] at ( 2.000*\report, 3.000, 0.000) (c6) {} ;
302 \node[noeudI] at ( 2.000*\report, 0.000, 4.000) (c7) {} ;
303 \node[noeudI] at ( 2.000*\report, 3.000, 4.000) (c8) {} ;
304 \node[noeudI] at ( 0.000*\report, 3.000, 0.000) (c9) {} ;
305 \node[noeudI] at ( 0.000*\report, 0.000, 4.000) (c10) {} ;
306 \node[noeudI] at ( 0.000*\report, 3.000, 4.000) (c11) {} ;
307
308 \draw[maille] (c0) -- (c5);
309 \draw[maille] (c0) -- (c9);
310 \draw[maille] (c5) -- (c6);
311 \draw[maille] (c6) -- (c9);
312 \draw[maille] (c0) -- (c10);
313 \draw[maille] (c5) -- (c7);
314 \draw[maille] (c9) -- (c11);
315 \draw[maille] (c6) -- (c8);
316 \draw[maille] (c7) -- (c10);
317 \draw[maille] (c10) -- (c11);
318 \draw[maille] (c11) -- (c8);
319 \draw[maille] (c8) -- (c7);
320 \draw[vecteur] (c0) -- (c5) node[above, xshift=2mm, yshift=3mm] {$\vec{a}$};
321 \draw[vecteur] (c0) -- (c9) node[above, xshift=-4mm] {$\vec{b}$};
322 \draw[vecteur] (c0) -- (c10) node[right, yshift=-4mm] {$\vec{c}$};
323
324 \node[noeudI] at ( 1.000*\report, 1.500, 2.000) (c4) {} ;
325 \end{tikzpicture}
326
327 % Reseau orthorhombique base centre

```

```

328
329 \begin{tikzpicture}[view]
330   \node[noeudI] at ( 0.000*\report, 0.000, 0.000) (c0) {};
331   \node[noeudI] at ( 2.000*\report, 0.000, 0.000) (c5) {};
332   \node[noeudI] at ( 2.000*\report, 3.000, 0.000) (c6) {};
333   \node[noeudI] at ( 2.000*\report, 0.000, 4.000) (c7) {};
334   \node[noeudI] at ( 2.000*\report, 3.000, 4.000) (c8) {};
335   \node[noeudI] at ( 0.000*\report, 3.000, 0.000) (c9) {};
336   \node[noeudI] at ( 0.000*\report, 0.000, 4.000) (c10) {};
337   \node[noeudI] at ( 0.000*\report, 3.000, 4.000) (c11) {};
338
339   \draw[maille] (c0) -- (c5);
340   \draw[maille] (c0) -- (c9);
341   \draw[maille] (c5) -- (c6);
342   \draw[maille] (c6) -- (c9);
343   \draw[maille] (c0) -- (c10);
344   \draw[maille] (c5) -- (c7);
345   \draw[maille] (c9) -- (c11);
346   \draw[maille] (c6) -- (c8);
347   \draw[maille] (c7) -- (c10);
348   \draw[maille] (c10) -- (c11);
349   \draw[maille] (c11) -- (c8);
350   \draw[maille] (c8) -- (c7);
351   \draw[vecteur] (c0) -- (c5) node[above, xshift=2mm, yshift=3mm] {$\vec{a}$};
352   \draw[vecteur] (c0) -- (c9) node[above, xshift=-4mm] {$\vec{b}$};
353   \draw[vecteur] (c0) -- (c10) node[right, yshift=-4mm] {$\vec{c}$};
354
355   \node[noeudI] at ( 1.000*\report, 0.000, 2.000) (c2) {};
356   \node[noeudI] at ( 1.000*\report, 3.000, 2.000) (c13) {};
357 \end{tikzpicture}
358
359 % Réseau orthorhombique faces centrees
360
361 \begin{tikzpicture}[view]
362   \node[noeudF] at ( 0.000*\report, 0.000, 0.000) (c0) {};
363   \node[noeudF] at ( 2.000*\report, 0.000, 0.000) (c5) {};
364   \node[noeudF] at ( 2.000*\report, 3.000, 0.000) (c6) {};
365   \node[noeudF] at ( 2.000*\report, 0.000, 4.000) (c7) {};
366   \node[noeudF] at ( 2.000*\report, 3.000, 4.000) (c8) {};
367   \node[noeudF] at ( 0.000*\report, 3.000, 0.000) (c9) {};
368   \node[noeudF] at ( 0.000*\report, 0.000, 4.000) (c10) {};
369   \node[noeudF] at ( 0.000*\report, 3.000, 4.000) (c11) {};
370
371   \draw[maille] (c0) -- (c5);
372   \draw[maille] (c0) -- (c9);
373   \draw[maille] (c5) -- (c6);
374   \draw[maille] (c6) -- (c9);
375   \draw[maille] (c0) -- (c10);
376   \draw[maille] (c5) -- (c7);
377   \draw[maille] (c9) -- (c11);
378   \draw[maille] (c6) -- (c8);
379   \draw[maille] (c7) -- (c10);
380   \draw[maille] (c10) -- (c11);
381   \draw[maille] (c11) -- (c8);
382   \draw[maille] (c8) -- (c7);
383   \draw[vecteur] (c0) -- (c5) node[above, xshift=2mm, yshift=3mm] {$\vec{a}$};
384   \draw[vecteur] (c0) -- (c9) node[above, xshift=-4mm] {$\vec{b}$};
385   \draw[vecteur] (c0) -- (c10) node[right, yshift=-4mm] {$\vec{c}$};
386
387   \node[noeudF] at ( 1.000*\report, 1.500, 0.000) (c1) {};
388   \node[noeudF] at ( 0.000*\report, 1.500, 2.000) (c2) {};
389   \node[noeudF] at ( 1.000*\report, 0.000, 2.000) (c3) {};
390   \node[noeudF] at ( 1.000*\report, 1.500, 4.000) (c12) {};
391   \node[noeudF] at ( 2.000*\report, 1.500, 2.000) (c13) {};
392   \node[noeudF] at ( 1.000*\report, 3.000, 2.000) (c14) {};
393 \end{tikzpicture}

```

```

394
395 %
396 % Systeme monoclinique
397 %
398
399 % Reseau monoclinique primitif
400
401 \begin{tikzpicture}[view]
402   \draw[axe] (c0) -- ++ (2.5,0,0) node[below] {x};
403   \draw[axe] (c0) -- ++ (0,4,0) node[above] {y};
404   \draw[axe] (c0) -- ++ (0,0,3.5) node[left] {z};
405
406   \node[noeudP] at ( 0.000*\report, 0.000, 0.000) (c0) {} ;
407   \node[noeudP] at ( 2.000*\report, 0.000, 0.000) (c2) {} ;
408   \node[noeudP] at ( 2.000*\report, 3.000, 0.000) (c3) {} ;
409   \node[noeudP] at ( 4.000*\report, 0.000, 3.464) (c4) {} ;
410   \node[noeudP] at ( 4.000*\report, 3.000, 3.464) (c5) {} ;
411   \node[noeudP] at ( 0.000*\report, 3.000, 0.000) (c6) {} ;
412   \node[noeudP] at ( 2.000*\report, 0.000, 3.464) (c7) {} ;
413   \node[noeudP] at ( 2.000*\report, 3.000, 3.464) (c8) {} ;
414
415   \draw[maille] (c0) -- (c2);
416   \draw[maille] (c3) -- (c2);
417   \draw[maille] (c3) -- (c6);
418   \draw[maille] (c0) -- (c6);
419   \draw[maille] (c0) -- (c7);
420   \draw[maille] (c4) -- (c7);
421   \draw[maille] (c4) -- (c5);
422   \draw[maille] (c8) -- (c5);
423   \draw[maille] (c8) -- (c7);
424   \draw[maille] (c5) -- (c3);
425   \draw[maille] (c2) -- (c4);
426   \draw[maille] (c8) -- (c6);
427   \draw[vecteur] (c0) -- (c2) node[above, xshift=2mm, yshift=2mm] {$\vec{a}$};
428   \draw[vecteur] (c0) -- (c6) node[above, xshift=-5mm, yshift=1mm] {$\vec{b}$};
429   \draw[vecteur] (c0) -- (c7) node[right, yshift=-5mm, xshift=-3mm] {$\vec{c}$};
430 \end{tikzpicture}
431
432 % Reseau monoclinique base centree
433
434 \begin{tikzpicture}[view]
435   \draw[axe] (c0) -- ++ (2.5,0,0) node[below] {x};
436   \draw[axe] (c0) -- ++ (0,4,0) node[above] {y};
437   \draw[axe] (c0) -- ++ (0,0,3.5) node[left] {z};
438
439   \node[noeudI] at ( 0.000*\report, 0.000, 0.000) (c0) {} ;
440   \node[noeudI] at ( 1.000*\report, 1.500, 0.000) (c1) {} ;
441   \node[noeudI] at ( 2.000*\report, 0.000, 0.000) (c2) {} ;
442   \node[noeudI] at ( 2.000*\report, 3.000, 0.000) (c3) {} ;
443   \node[noeudI] at ( 4.000*\report, 0.000, 3.464) (c4) {} ;
444   \node[noeudI] at ( 4.000*\report, 3.000, 3.464) (c5) {} ;
445   \node[noeudI] at ( 0.000*\report, 3.000, 0.000) (c6) {} ;
446   \node[noeudI] at ( 2.000*\report, 0.000, 3.464) (c7) {} ;
447   \node[noeudI] at ( 2.000*\report, 3.000, 3.464) (c8) {} ;
448   \node[noeudI] at ( 3.000*\report, 1.500, 3.464) (c9) {} ;
449
450   \draw[maille] (c0) -- (c2);
451   \draw[maille] (c3) -- (c2);
452   \draw[maille] (c3) -- (c6);
453   \draw[maille] (c0) -- (c6);
454   \draw[maille] (c0) -- (c7);
455   \draw[maille] (c4) -- (c7);
456   \draw[maille] (c4) -- (c5);
457   \draw[maille] (c8) -- (c5);
458   \draw[maille] (c8) -- (c7);
459   \draw[maille] (c5) -- (c3);

```

```

460 \draw[maille] (c2) -- (c4);
461 \draw[maille] (c8) -- (c6);
462 \draw[vecteur] (c0) -- (c2) node[above, xshift=2mm, yshift=2mm] {$\vec{a}$};
463 \draw[vecteur] (c0) -- (c6) node[above, xshift=-5mm, yshift=1mm] {$\vec{b}$};
464 \draw[vecteur] (c0) -- (c7) node[right, yshift=-5mm, xshift=-3mm] {$\vec{c}$};
465 \end{tikzpicture}
466
467 %
468 % Systeme triclinique
469 %
470
471 % Reseau triclinique primitif
472 \begin{tikzpicture}[view]
473 \draw[axe] (c0) -- ++ (2.5,0,0) node[below] {x};
474 \draw[axe] (c0) -- ++ (0,4,0) node[above] {y};
475 \draw[axe] (c0) -- ++ (0,0,3.5) node[left] {z};
476
477 \node[noeudP] at ( 0.000*\report, 0.000, 0.000) (c0) {};
478 \node[noeudP] at ( 2.000*\report, 0.000, 0.000) (c1) {};
479 \node[noeudP] at ( 2.521*\report, 2.954, 0.000) (c2) {};
480 \node[noeudP] at ( 4.000*\report, -1.058, 3.299) (c3) {};
481 \node[noeudP] at ( 4.521*\report, 1.896, 3.299) (c4) {};
482 \node[noeudP] at ( 0.521*\report, 2.954, 0.000) (c5) {};
483 \node[noeudP] at ( 2.000*\report, -1.058, 3.299) (c6) {};
484 \node[noeudP] at ( 2.521*\report, 1.896, 3.299) (c7) {};
485
486 \draw[maille] (c0) -- (c1);
487 \draw[maille] (c2) -- (c1);
488 \draw[maille] (c2) -- (c5);
489 \draw[maille] (c0) -- (c5);
490 \draw[maille] (c1) -- (c3);
491 \draw[maille] (c0) -- (c6);
492 \draw[maille] (c2) -- (c4);
493 \draw[maille] (c5) -- (c7);
494 \draw[maille] (c4) -- (c7);
495 \draw[maille] (c4) -- (c3);
496 \draw[maille] (c6) -- (c3);
497 \draw[maille] (c6) -- (c7);
498 \draw[vecteur] (c0) -- (c1) node[above, xshift=2mm, yshift=2mm] {$\vec{a}$};
499 \draw[vecteur] (c0) -- (c5) node[above, xshift=-8mm, yshift=0mm] {$\vec{b}$};
500 \draw[vecteur] (c0) -- (c6) node[right, yshift=-3mm, xshift=4mm] {$\vec{c}$};
501 \end{tikzpicture}
502
503 \end{multicols}

```