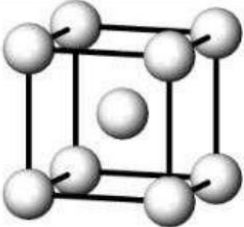
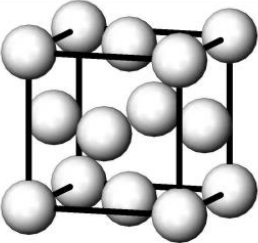
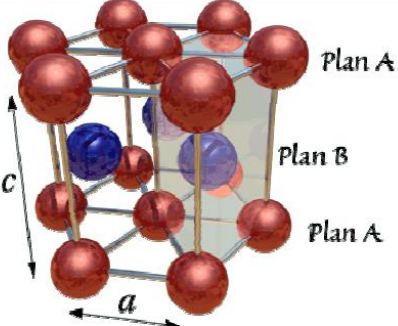
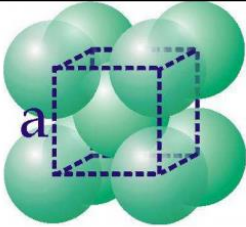
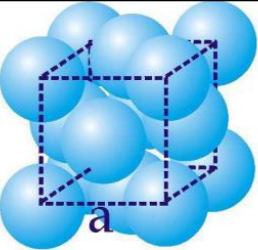
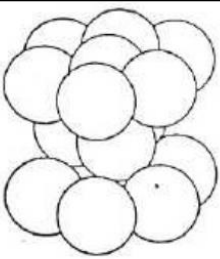


## ANNEXES - Les cristaux métalliques

|           |           |           |           |           |           |           |           |           |           |           |           |           |           |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Li<br>156 | Be<br>113 |           |           |           |           |           |           |           |           |           |           |           |           |
| Na<br>191 | Mg<br>160 |           |           |           |           |           |           |           |           |           |           | Al<br>143 |           |
| K<br>238  | Ca<br>197 | Sc<br>164 | Ti<br>146 | V<br>135  | Cr<br>128 | Mn<br>126 | Fe<br>127 | Co<br>125 | Ni<br>124 | Cu<br>128 | Zn<br>139 | Ga<br>141 |           |
| Rb<br>255 | Sr<br>215 | Y<br>181  | Zr<br>160 | Nb<br>147 | Mo<br>140 | Tc<br>136 | Ru<br>134 | Rh<br>135 | Pd<br>138 | Ag<br>144 | Cd<br>157 | In<br>166 | Sn<br>154 |

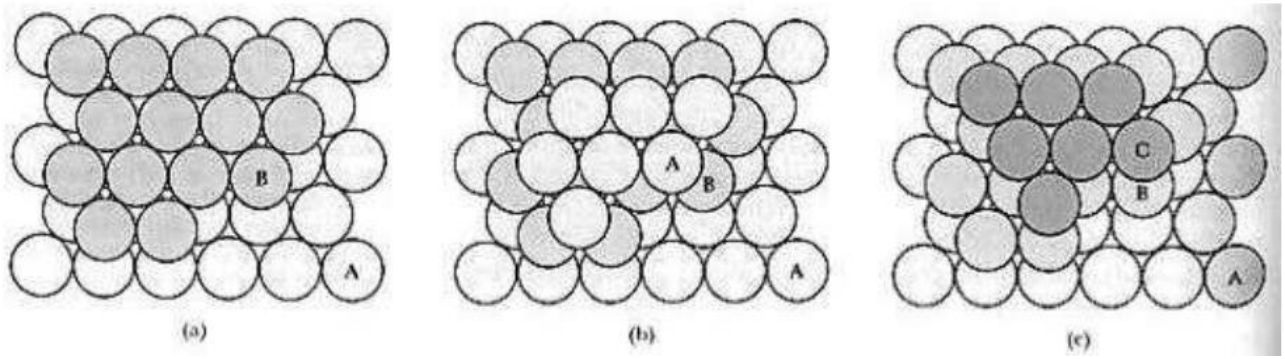
*Quelques rayons atomiques (en pm)*

|                              | Structure cubique centrée : CC                                                      | Structure cubique à faces centrées : CFC                                             | Structure hexagonale compacte : HC                                                    |
|------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| M O D E L E<br>E C L A T E   |   |   |   |
| M O D E L E<br>C O M P A C T |  |  |  |

Source : <http://www.seg.etsmtl.ca/> ; <http://www.uel-pcsm.education.fr/>

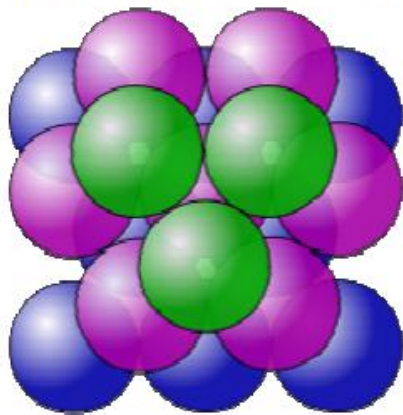
*Les types principaux de structure métallique*

## Les empilements compacts



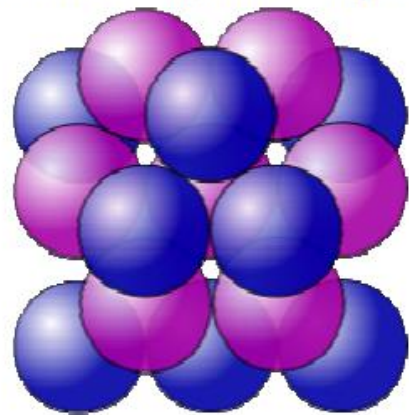
Source : <http://fr.wikiversity.org/> ; <http://www.ressources-pedagogiques.ups-tlse.fr/>

### Réseau cubique à faces centrées



Cubique à faces centrées ABC

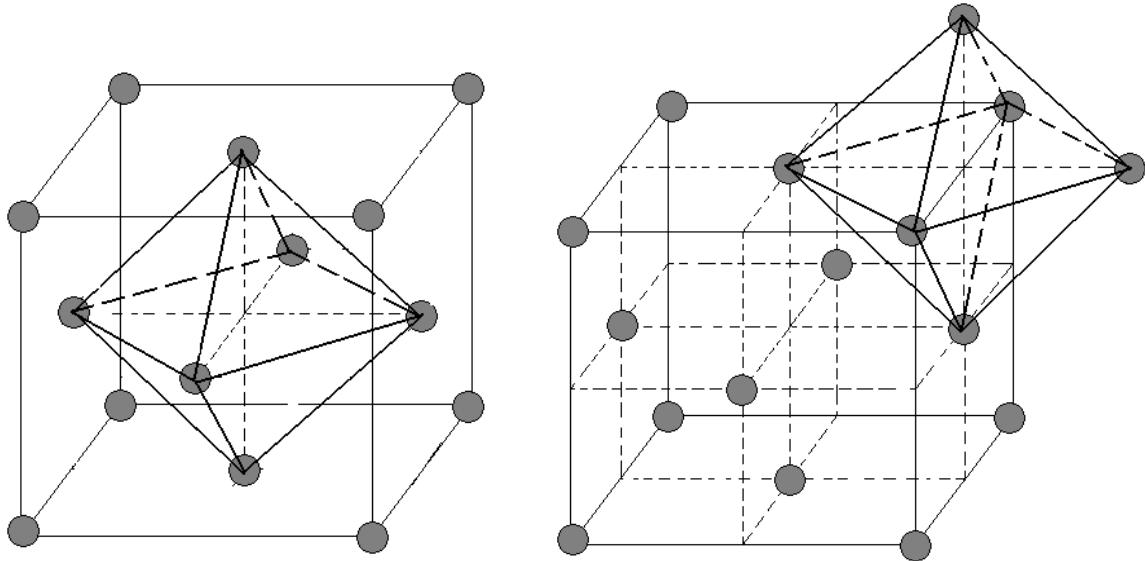
### Réseau hexagonal compact



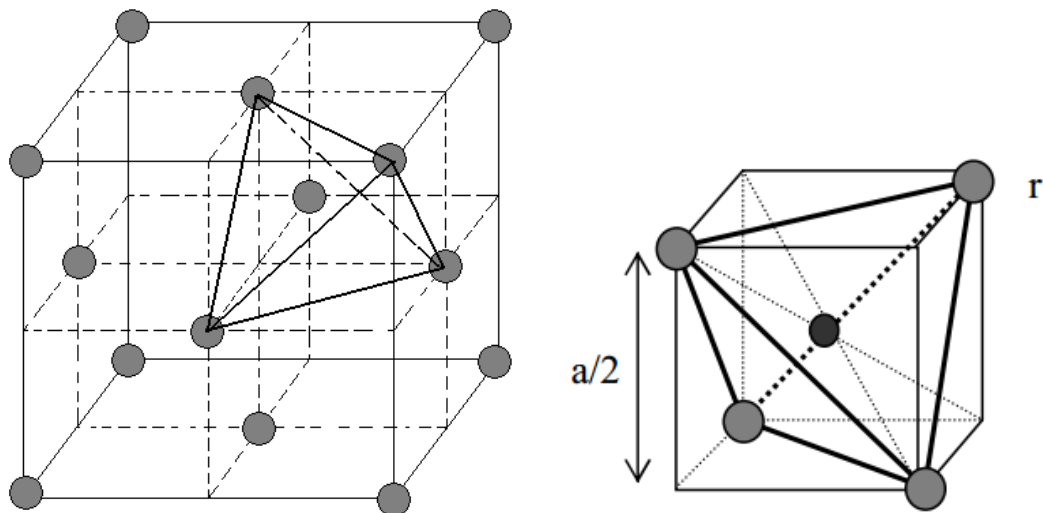
Hexagonal compact ABA

**Structure cubique faces centrées**

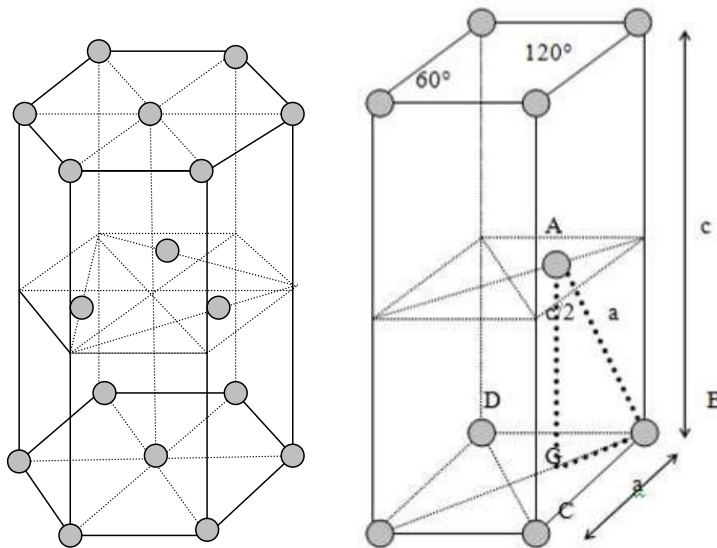
**Sites octaédriques :**



**Sites tétraédriques :**



## Structure hexagonale compacte



$$a = 2r$$

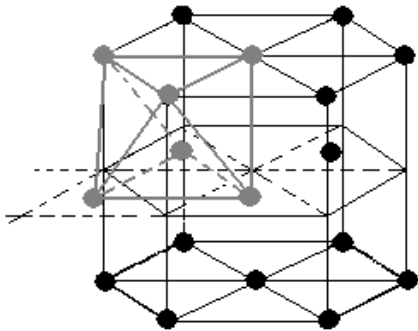
$$BG = \frac{a\sqrt{3}}{3} \text{ donc } c = 2a\sqrt{\frac{2}{3}}$$

**Volume de la maille primitive :**

$V = 2 \times \text{base} \times \text{hauteur}$

$$V = 2 \times \frac{a^2\sqrt{3}}{4} \times 2a\sqrt{\frac{2}{3}} = \sqrt{2} \cdot a^3$$

**Sites octaédriques :**



**Sites tétraédriques :**

