



1. Periodic Building Unit – 2. Connection mode – 3. Projections of the unit cell content
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1. Periodic Building Unit:

EMT and **FAU** can be built using the sodalite cage (or β -cage) consisting of 24 T atoms (six 4-rings, four 6-rings, three 6-2 units or four 1-4-1 units) shown in Figure 1. The two-dimensional Periodic Building Unit (PerBU) is obtained when β -cages are linked through double 6-rings (D6Rs) into the hexagonal faujasite layer depicted in Figure 2. The PerBU corresponds to the (001) layer in hexagonal **EMT** and to the (111) layer in cubic **FAU**. An alternative PerBU of **EMT** and **FAU** can be obtained using D6Rs (or 4-2 units; see [Alternative description](#)).

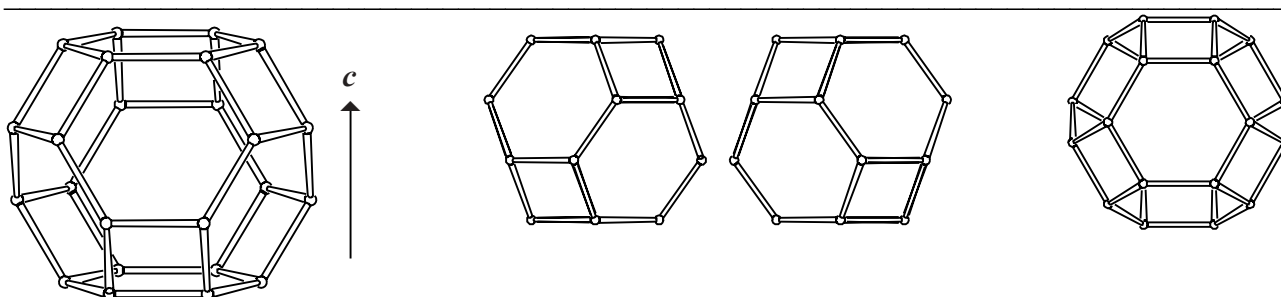


Figure 1. The sodalite cage. From left to right: perspective view perpendicular to c ; two parallel projections (different scale), related by a rotation of $+30^\circ$ and -30° about c ; and parallel projection down c .

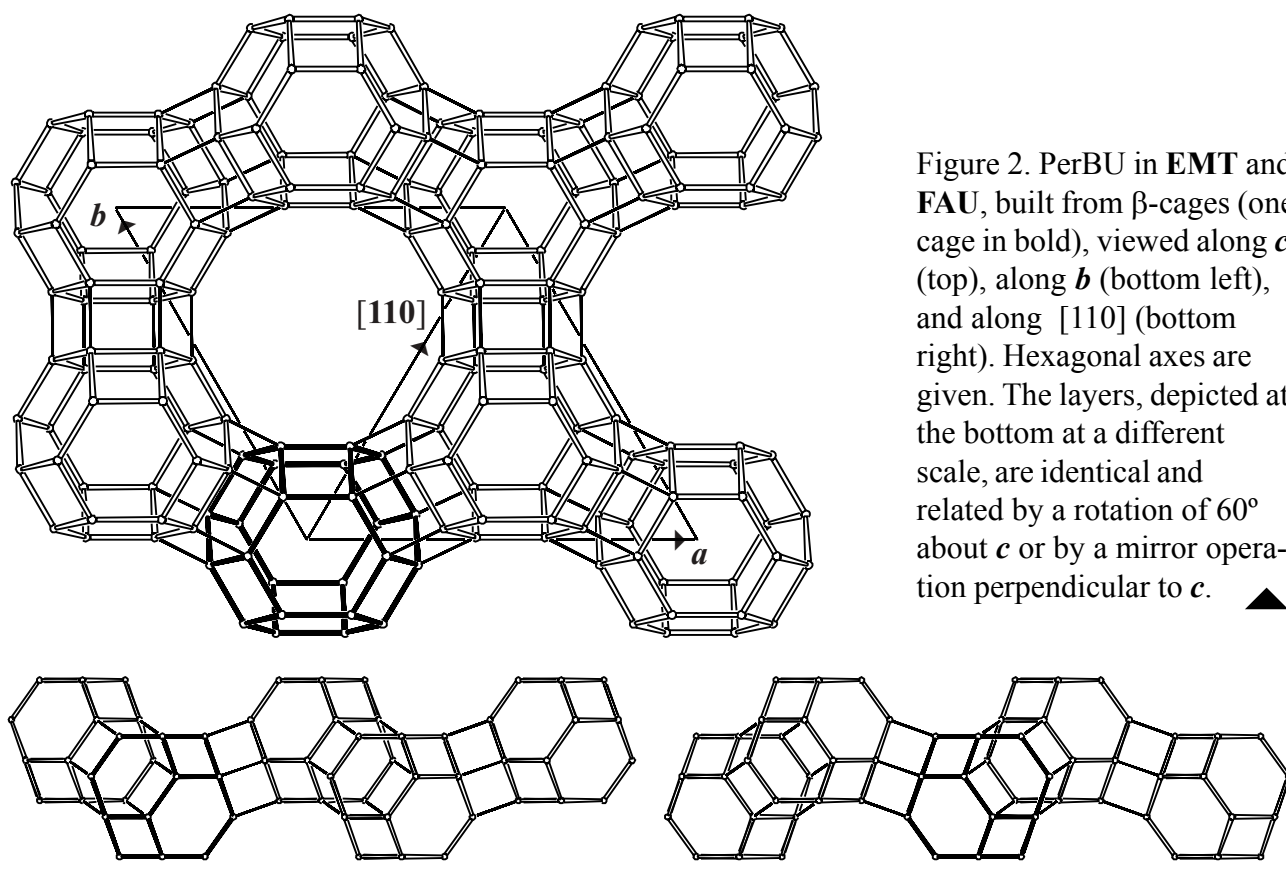


Figure 2. PerBU in **EMT** and **FAU**, built from β -cages (one cage in bold), viewed along c (top), along b (bottom left), and along $[110]$ (bottom right). Hexagonal axes are given. The layers, depicted at the bottom at a different scale, are identical and related by a rotation of 60° about c or by a mirror operation perpendicular to c . ▲

2. Connection mode:

Neighboring PerBUs can be connected along [001] through double 6-rings in two different ways:

(1): the top layer is shifted over $1/3(-a + b)$ before connecting it to the bottom layer. The resulting connectivity exhibits inversion symmetry between successive layers.

(2): the top layer is rotated over 60° about [001], followed by a shift of $1/3(-a + b)$, before connecting it to the bottom layer. The connectivity shows mirror symmetry between successive layers (compare Figure 2).

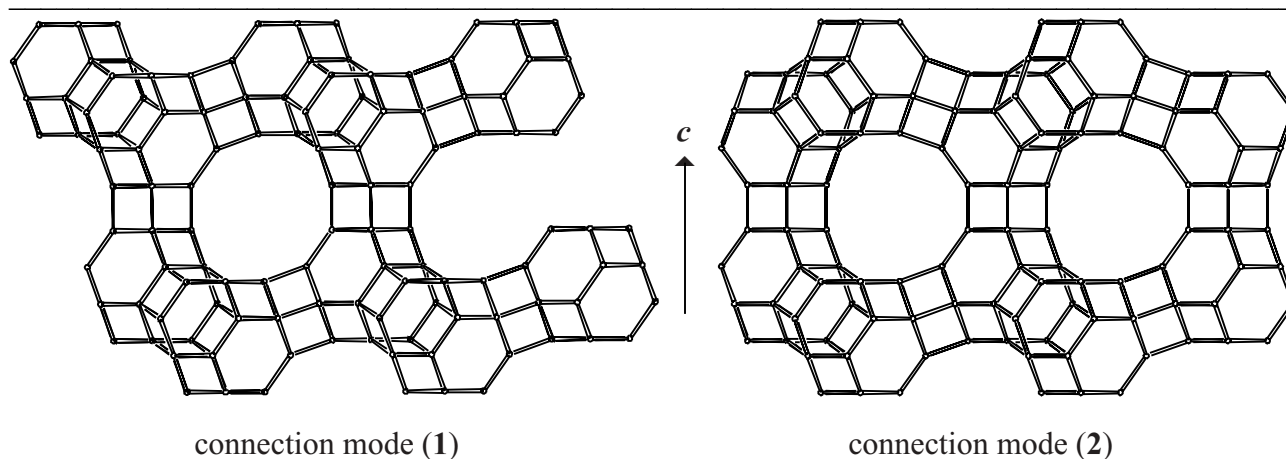


Figure 3. Connection mode (1) in FAU (left) and connection mode (2) in EMT viewed along b . ▲

3. Projections of the unit cell content:

Pure EMT and FAU are obtained when neighboring PerBUs are exclusively related by reflection and inversion, respectively.

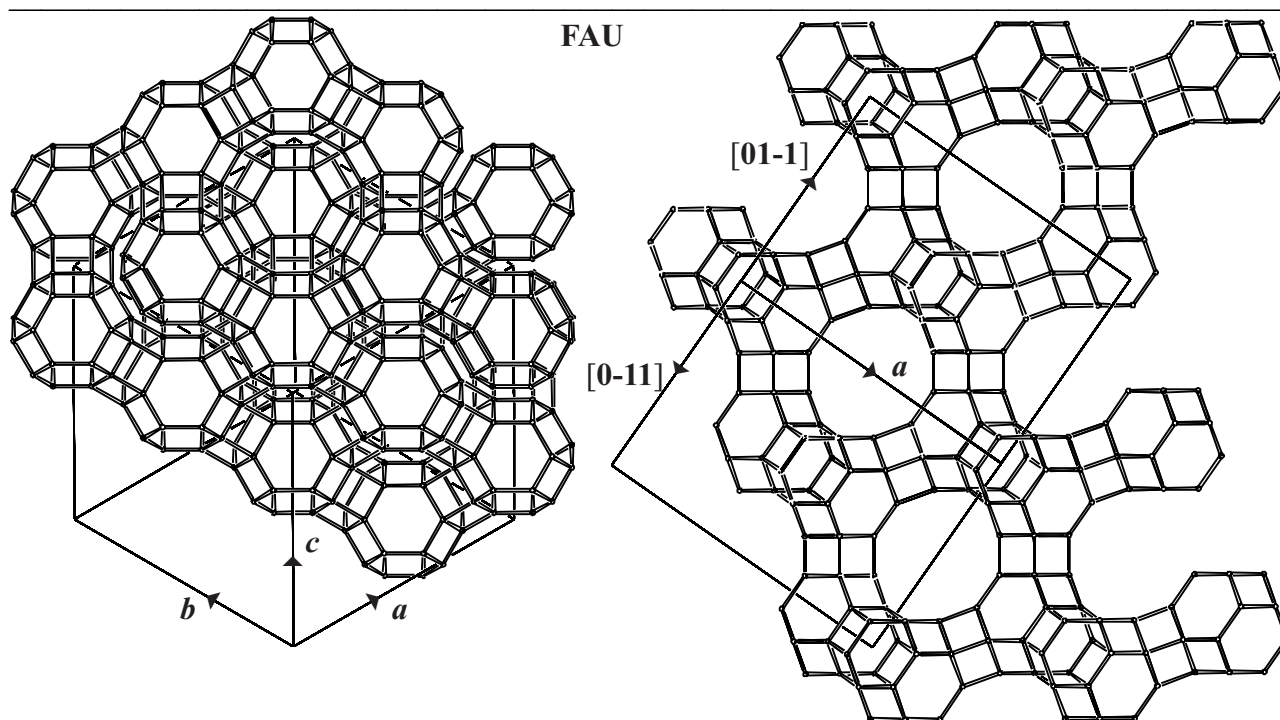


Figure 4. Unit cell content in FAU viewed along the cubic axes [111] (left) and [011] (right).
[Figure 4 is continued on next page]

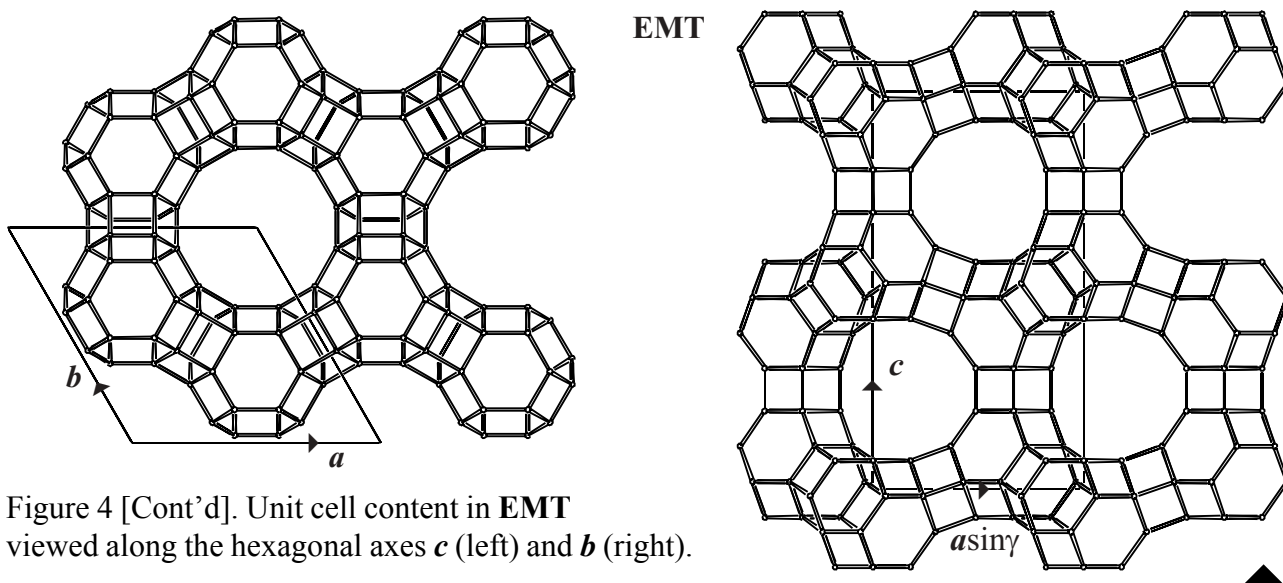


Figure 4 [Cont'd]. Unit cell content in **EMT** viewed along the hexagonal axes c (left) and b (right).

4. Channels and/or cages:

In hexagonal **EMT** 12-ring channels are parallel to $\langle 100 \rangle$ and in cubic **FAU** the 12-ring channels are parallel to $\langle 011 \rangle$. The channel intersections, or cavities, are depicted in Figure 5. For each type of cavity the **pore descriptor** is added in Figure 5. The fusion of the cavities is illustrated in Figure 6.

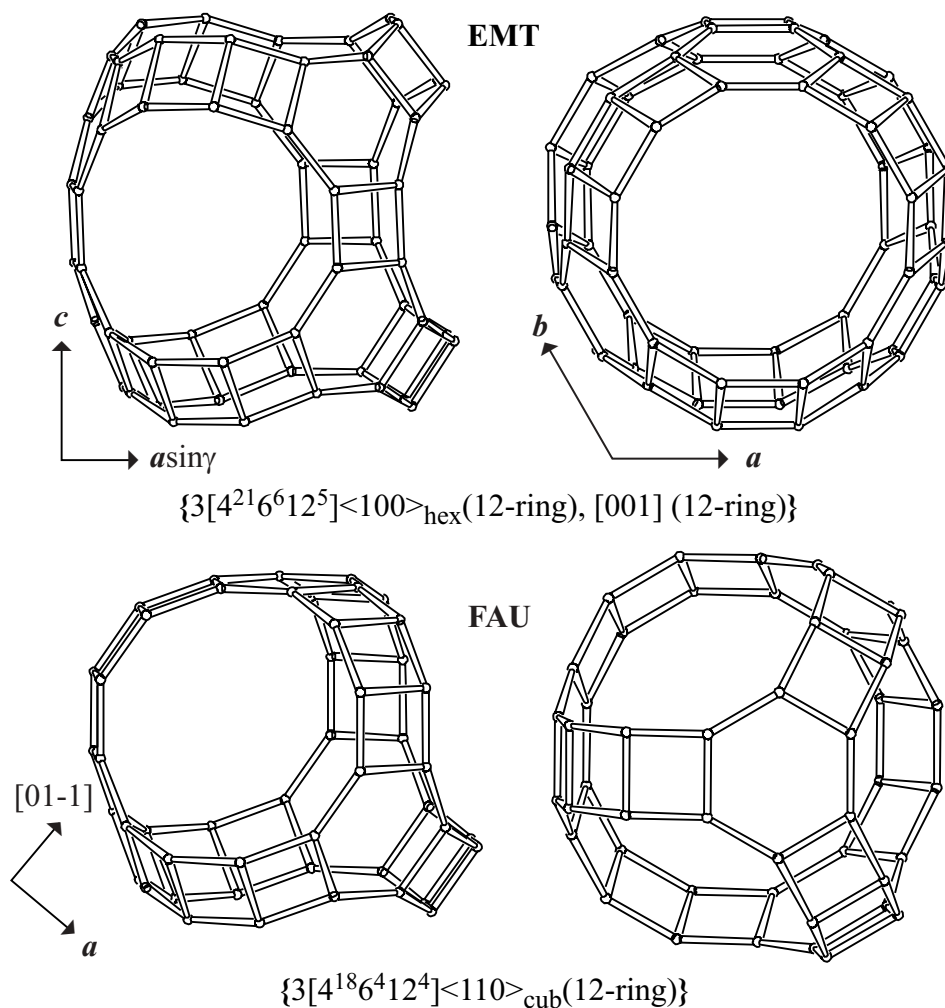
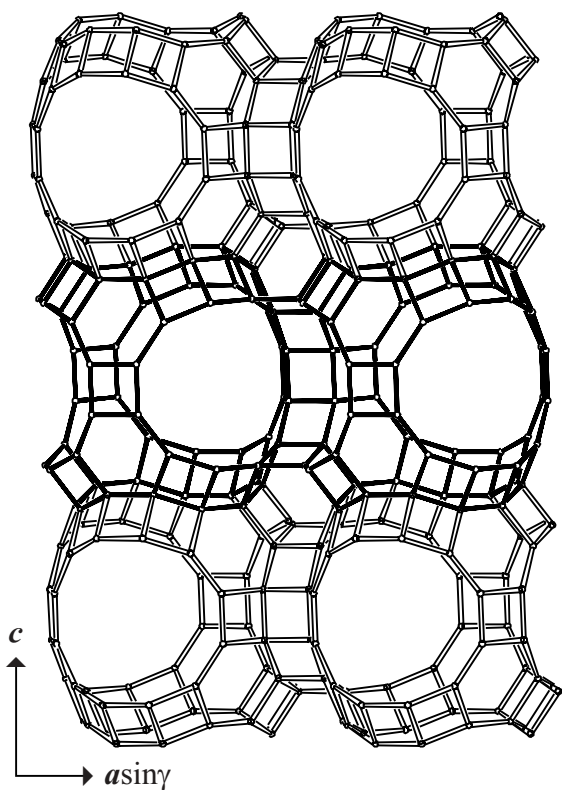


Figure 5. Cavity in **EMT** (top) viewed along b_{hex} (left) and along c_{hex} (right). Cavity in **FAU** (bottom) viewed along $[01-1]_{\text{cub}}$ (left) and along $[111]_{\text{cub}}$ (right).



EMT

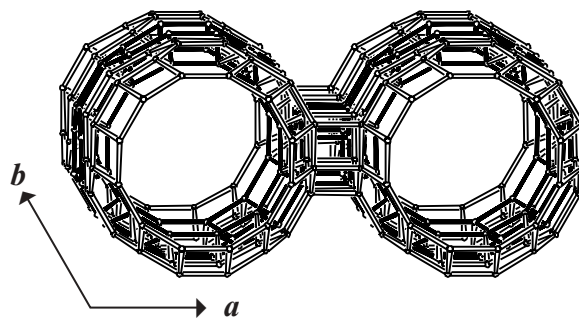
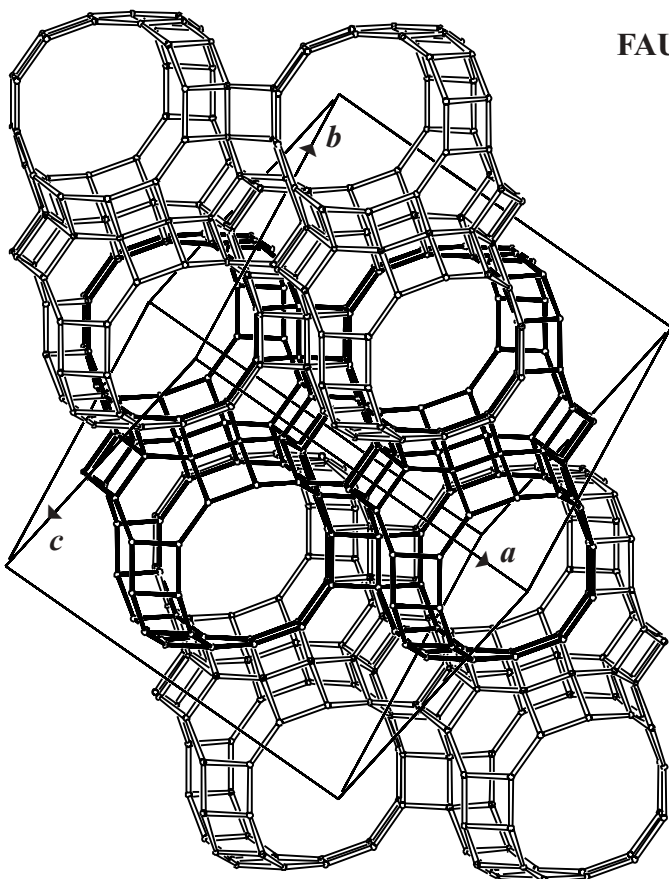


Figure 6. Fusion of the cavities in **EMT** viewed along $\langle 010 \rangle_{\text{hex}}$ (left), and along c_{hex} (right).



FAU

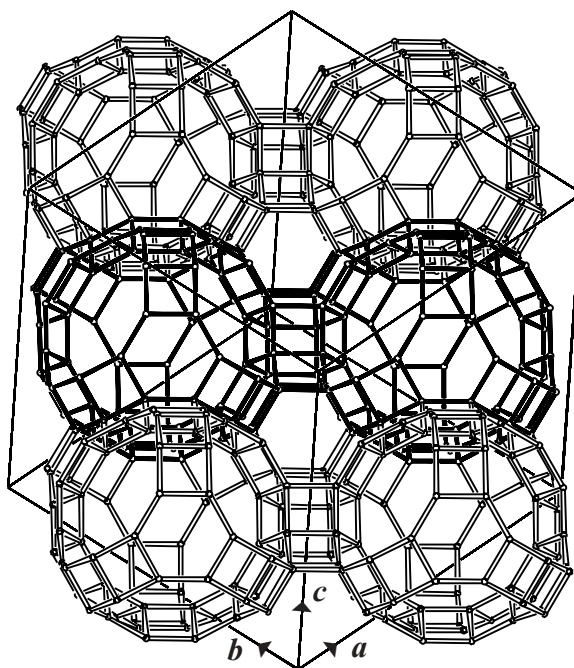


Figure 6 [Cont'd]. Fusion of cavities in **FAU** viewed along $\langle 011 \rangle_{\text{cub}}$ (left), and along $\langle 111 \rangle_{\text{cub}}$ (right). ▲

5. Supplementary information:

Other framework types containing (modified) cavities

Several framework types, like **EMT** and **FAU**, can be built using (modified) cavities.

In the **INTRO** pages links are given to a detailed description of a sub-set of framework types that contain (modified) cavities (choose: **Cages**). There is also a link provided to a summary of the PerBUs used in the building schemes of these framework types (choose: **Appendix; Figure 11**).

Alternative description of EMT and FAU using (modified) double 6-rings (D6Rs)

Several framework types, like **EMT** and **FAU**, can be built using (modified) D6Rs (see Figure 2, Figure 3 and Figure 4).

In the **INTRO** pages links are given to a detailed description of a sub-set of framework types that contain (modified) D6Rs (choose: **Double 6-rings**). There is also a link provided to a summary of the PerBUs used in the building schemes of these framework types (choose: **Appendix; Figure 6**).

