Building scheme for BOG

1. Periodic Building Unit:

BOG can be built using the T12-unit (bold in Figure 1) consisting of two 6-rings (or two 5-1 units; see **Alternative description**). The two 6-ring chairs are 4-fold connected into four fused 5-rings. T12-units are connected into chains along *c*. Neighboring T12-units in the chain are related by a rotation of 180º about *a*. This rotation over 180º is accompanied by a shift along +*b* or -*b* leading to left- and right-handed chains that are related by a mirror plane perpendicular to *b* as shown in Figure 1(a) and 1(b), respectively. The two-dimensional Periodic Building Unit (PerBU) is obtained when left- and right-handed chains are connected along *b* through double zigzag chains.
Alternatively, the chain can be constructed from 2-fold (1,3)-connected double 4-rings (D4Rs), connected through 5-rings to finite zigzag chains of 4 T atoms (in bold) as depicted in Figure 1(c). D4Rs within the chain are linked in the same way as in **BRE** (see also **Alternative description**).


(a)

(b)

(c)
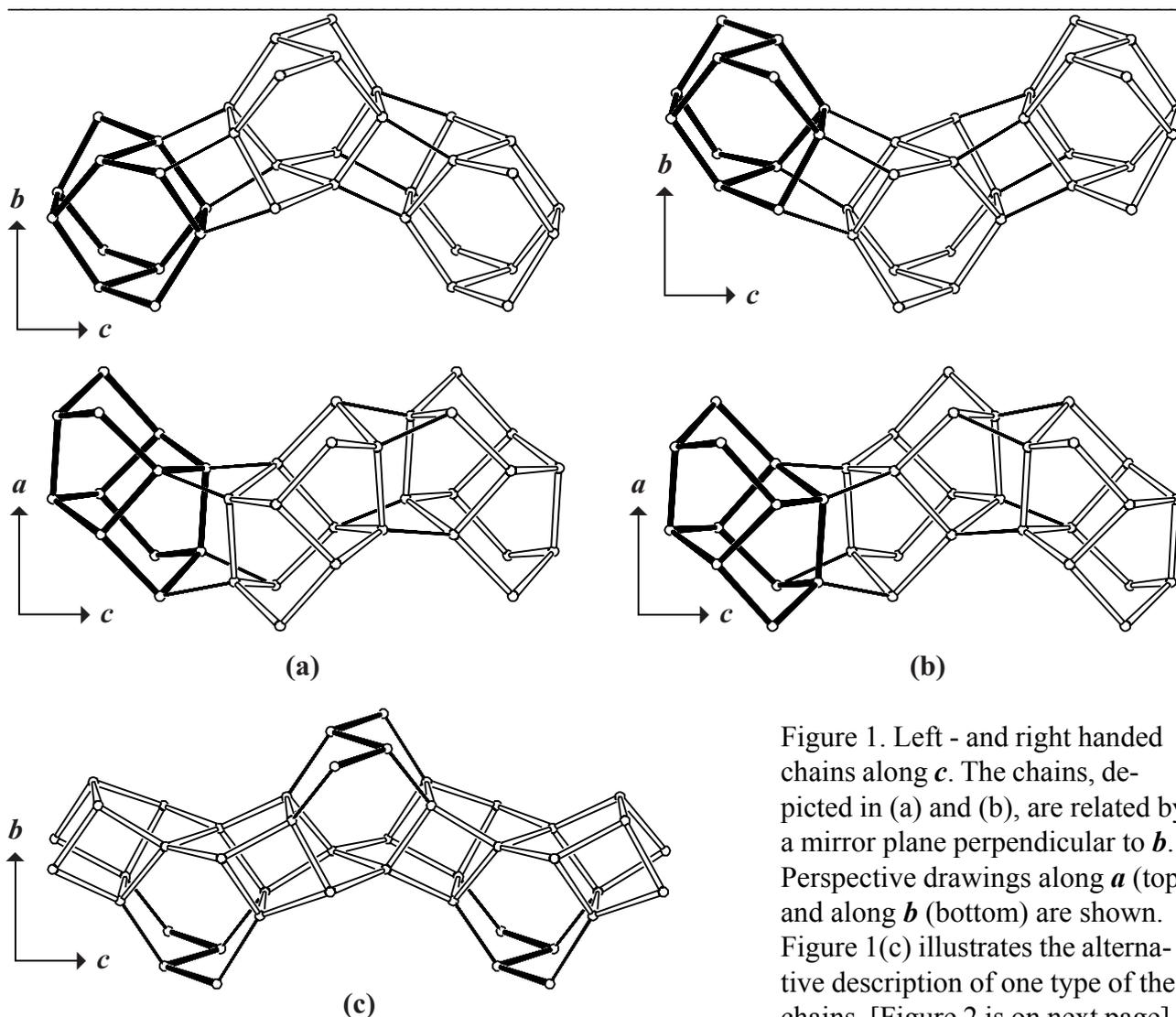
Figure 1. Left - and right handed chains along *c*. The chains, depicted in (a) and (b), are related by a mirror plane perpendicular to *b*. Perspective drawings along *a* (top) and along *b* (bottom) are shown. Figure 1(c) illustrates the alternative description of one type of the chains. [Figure 2 is on next page]
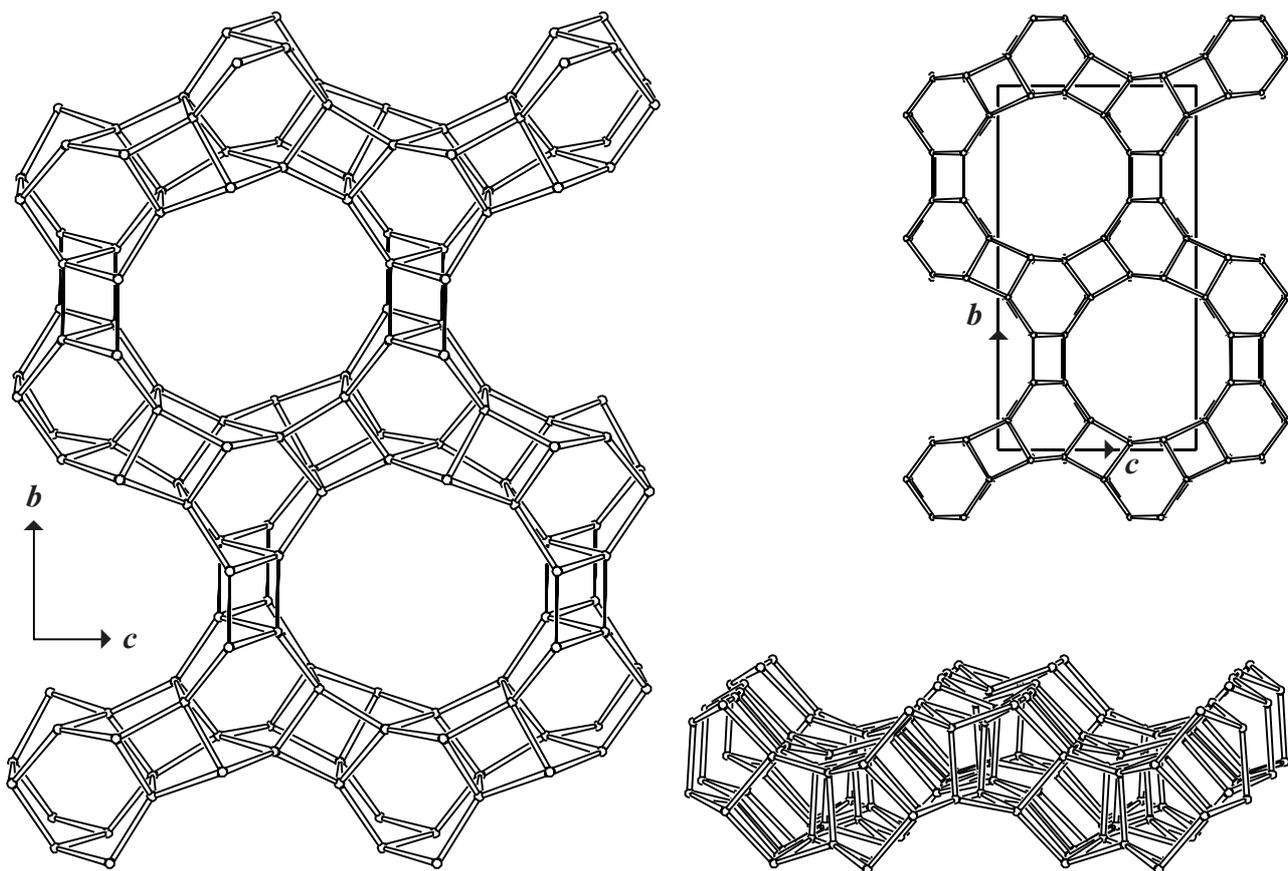
Figure 2. PerBU composed of chains, related by mirror planes perpendicular to **b**, viewed along **a** (left), and along **b** (bottom right) and projection of the unit cell content along **a** (top right). [Figure 1 and Figure 2 also illustrate that the PerBU can as well be built using 4-rings] ▲

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2. Connection mode:

Neighboring PerBUs, shifted with respect to each other over ½(**b** + **c**) (or by a mirror plane perpendicular to **a**), are connected along **a** through 4- and 6-rings as shown in Figure 3.
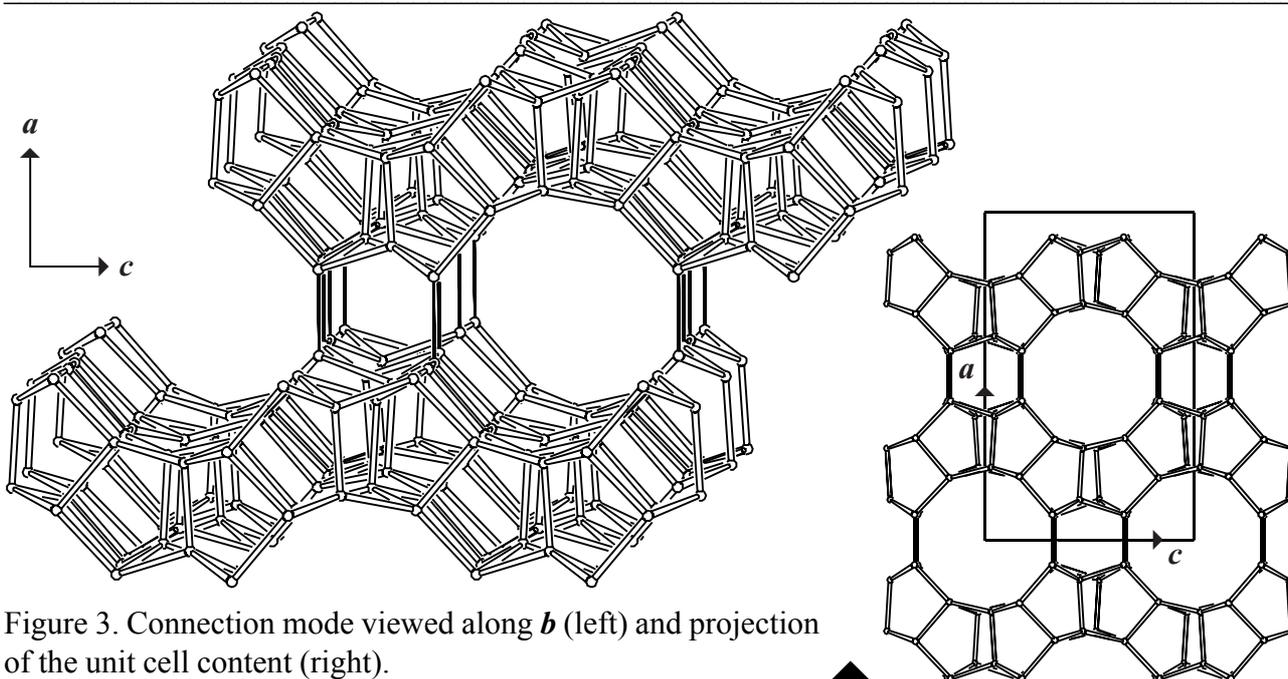
Figure 3. Connection mode viewed along **b** (left) and projection of the unit cell content (right). ▲

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3. Projections of the unit cell content: See Figures 2 and 3.

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4. Channels and/or cages:

Channel intersections, interconnected through 5-ring cavities, form 10-Ring channels and 12-ring channels parallel to **b** and **a**, respectively. The intersection (including the 5-ring cavity) is shown in Figure 4 together with the **pore descriptor**. The fusion of the intersections is illustrated in Figure 5.


{2 [$4^4 6^2 10^2 12^2$] [100] (12-ring), [010] (10-ring) / 1 [$4^4 5^8 12^2$] [100] (12-ring)}
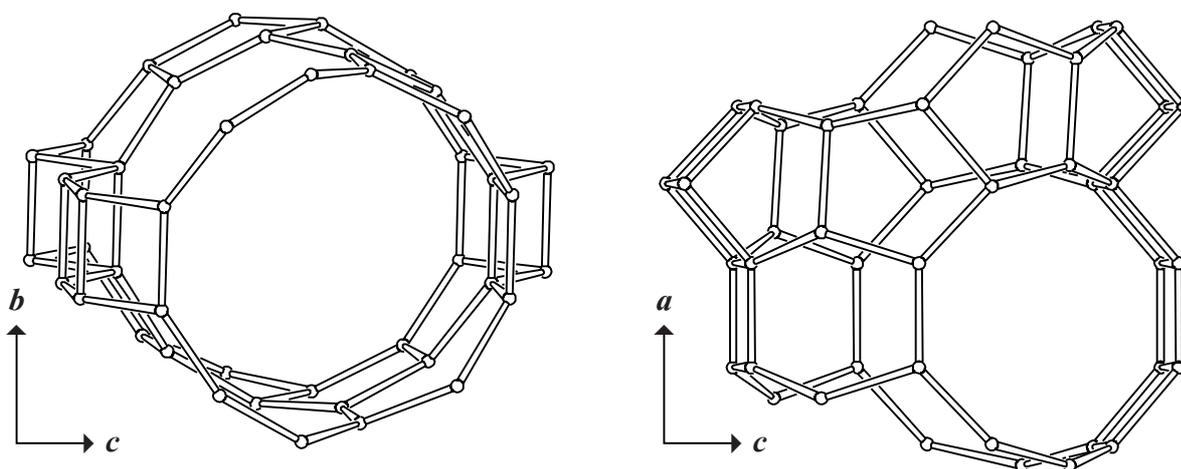
Figure4. View of the channel intersection (including the 5-ring cavity) viewed along **a** (top left), along **b** (top right), and along **c** (left).
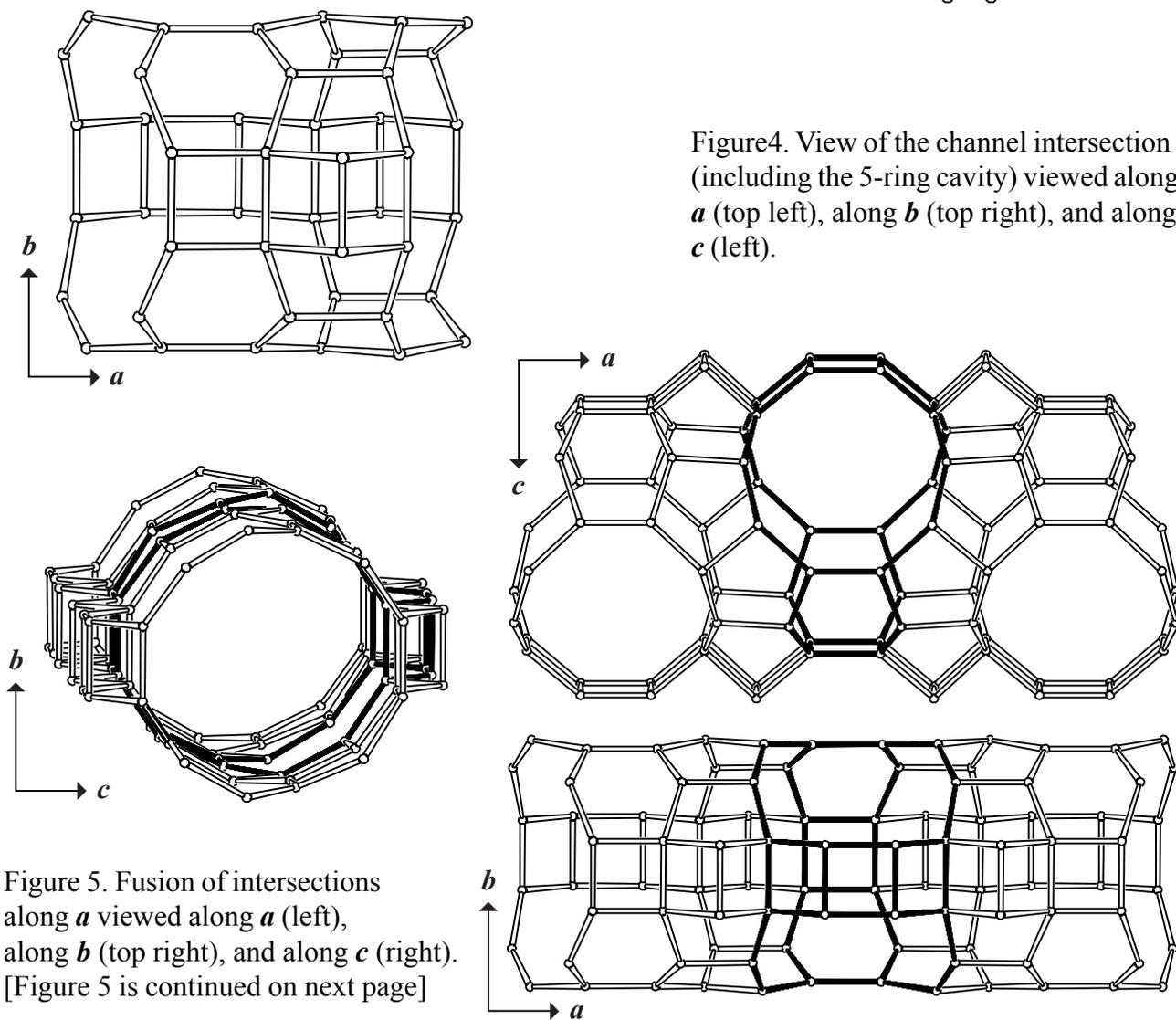
Figure 5. Fusion of intersections along **a** viewed along **a** (left), along **b** (top right), and along **c** (right). [Figure 5 is continued on next page]
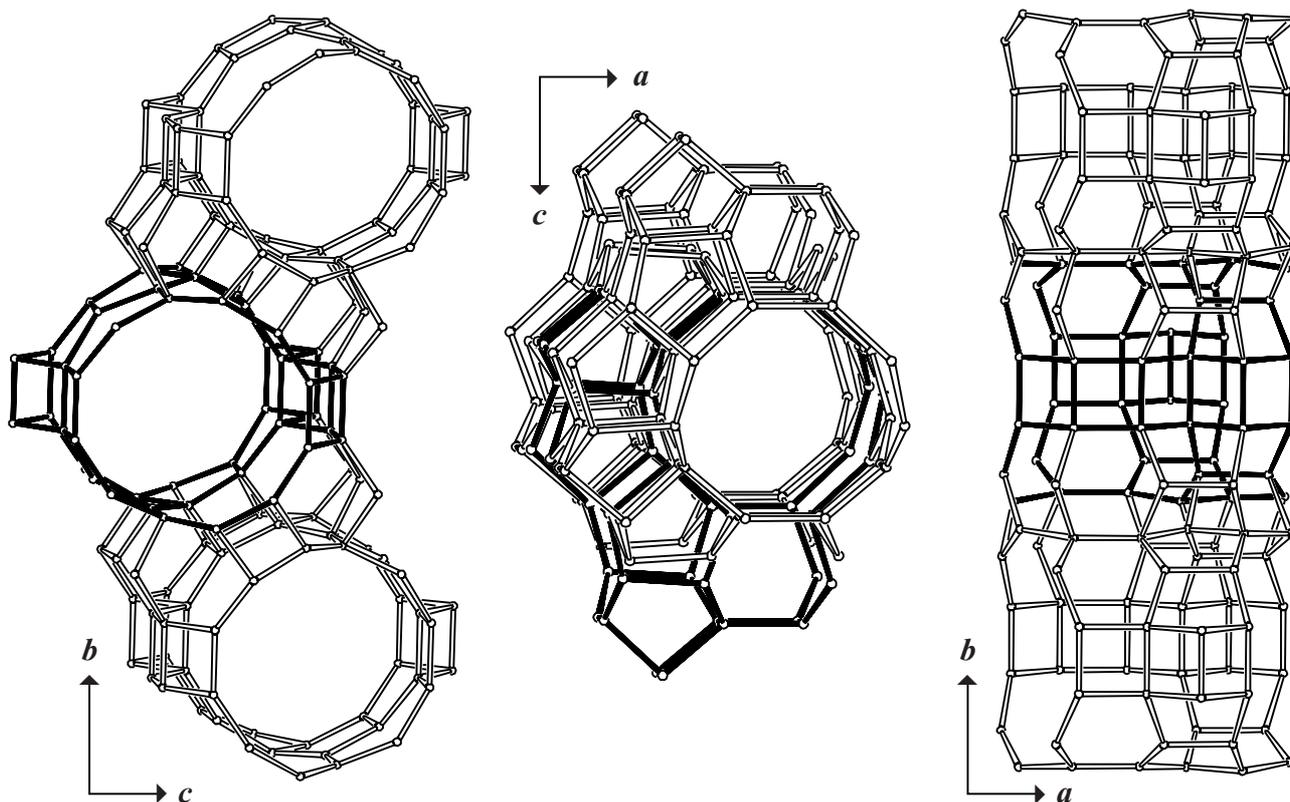
Figure 5. Fusion of intersections along **b** viewed along **a** (left), along **b** (middle), and along **c** (right).

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5. Supplementary information:

Other framework types containing (modified) double 6-rings (D6Rs)
Several other framework types can be built using (modified) D6Rs.
In the **INTRO** pages links are given to descriptions of other framework types containing (modified)
D6Rs (choose: **Double 6-rings**). There is also a link provided to a summary of the Periodic Building
Units used in the building schemes of these framework types (choose: **Appendix; Figure 7).**

Alternative description of **BOG** *using (modified) double 4-rings (D4Rs)*
Several framework types, like **BOG**, can be built using (modified) D4Rs (see Figure 1(c)).
In the **INTRO** pages links are given to a detailed description of a sub-set of framework types that
contain (modified) D4Rs (choose: **Double 4-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 5**).

Alternative description using (modified) 5-rings
Several framework types, like **BIK**, can be constructed using (modified) 5-rings.
In the **INTRO** pages links are given to detailed descriptions of these framework types (choose:
5-Rings). There is also a link provided to a summary of the Periodic Building Units used in the
building schemes of these framework types (choose: **Appendix**; **Figure 6**).

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