

## 1. Periodic Building Unit:

**CDO** and **FER** can be built using the saw (s) chain (bold in Fig.1 (a)) parallel to **z**. The repeat distance along the saw chain is about 7.5 Å and the repeat unit consists of 3 T atoms. Three s chains are connected into an infinite building unit. A two-dimensional Periodic Building Unit (PerBU) is obtained when infinite building units, related by a rotation of 180° about **y** and a shift of  $\frac{1}{2}\mathbf{z}$ , are connected along **y** into the **yz** layer depicted in Fig.1(b). The PerBU can be considered as a strongly corrugated layer of (fused) 6-ring boats with “handles” of three additional T atoms.

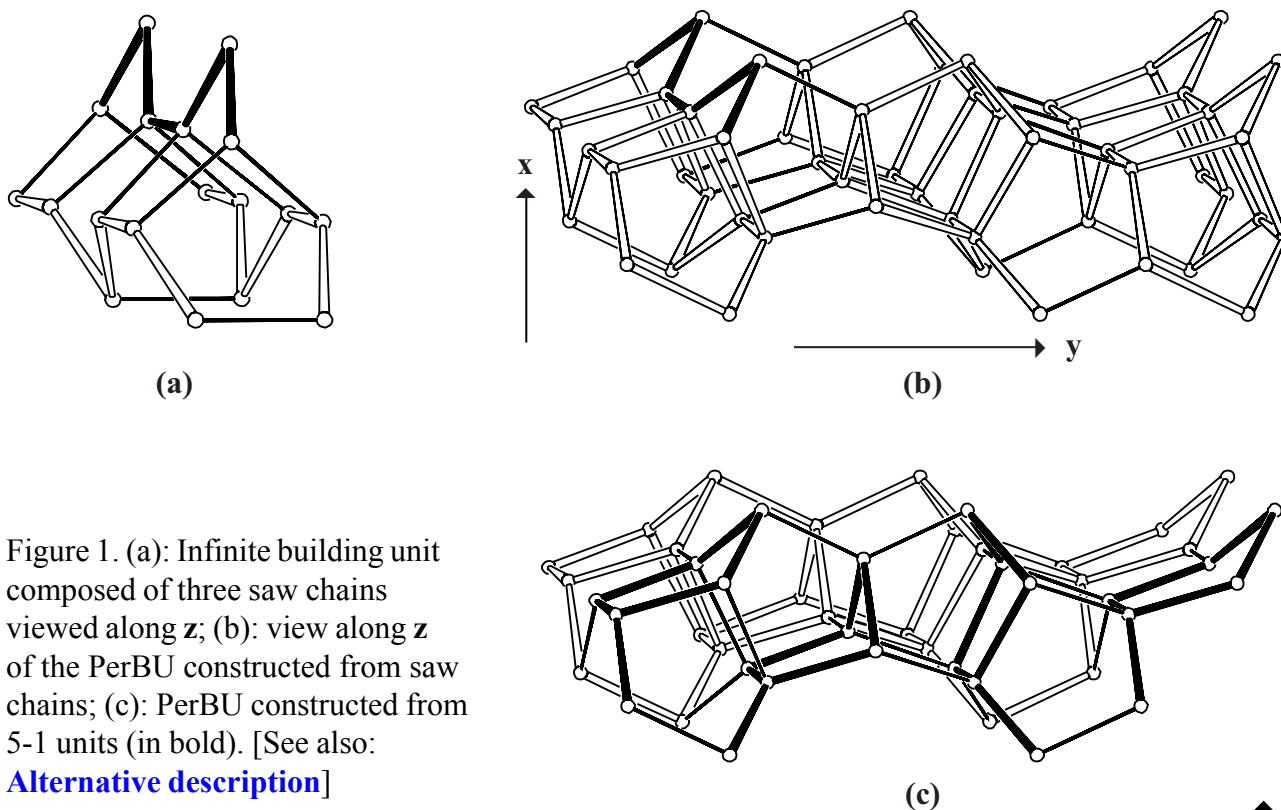


Figure 1. (a): Infinite building unit composed of three saw chains viewed along **z**; (b): view along **z** of the PerBU constructed from saw chains; (c): PerBU constructed from 5-1 units (in bold). [See also: [Alternative description](#)]

## 2. Connection mode:

Neighboring PerBUs can be connected along **x** in two different ways (see Figure 2 on next page):

- (1): PerBUs, related by a shift of  $\frac{1}{2}(\mathbf{x} + \mathbf{z})$ , are connected through 8-rings.
- (2): PerBUs, related by a shift of  $\frac{1}{2}(\mathbf{x} + \mathbf{y} + \mathbf{z})$ , are connected through 6-, 8- and 10-rings.

[In **DAC**, **EPI** and **MOR** corrugated 6-ring layers are connected through 4-rings]

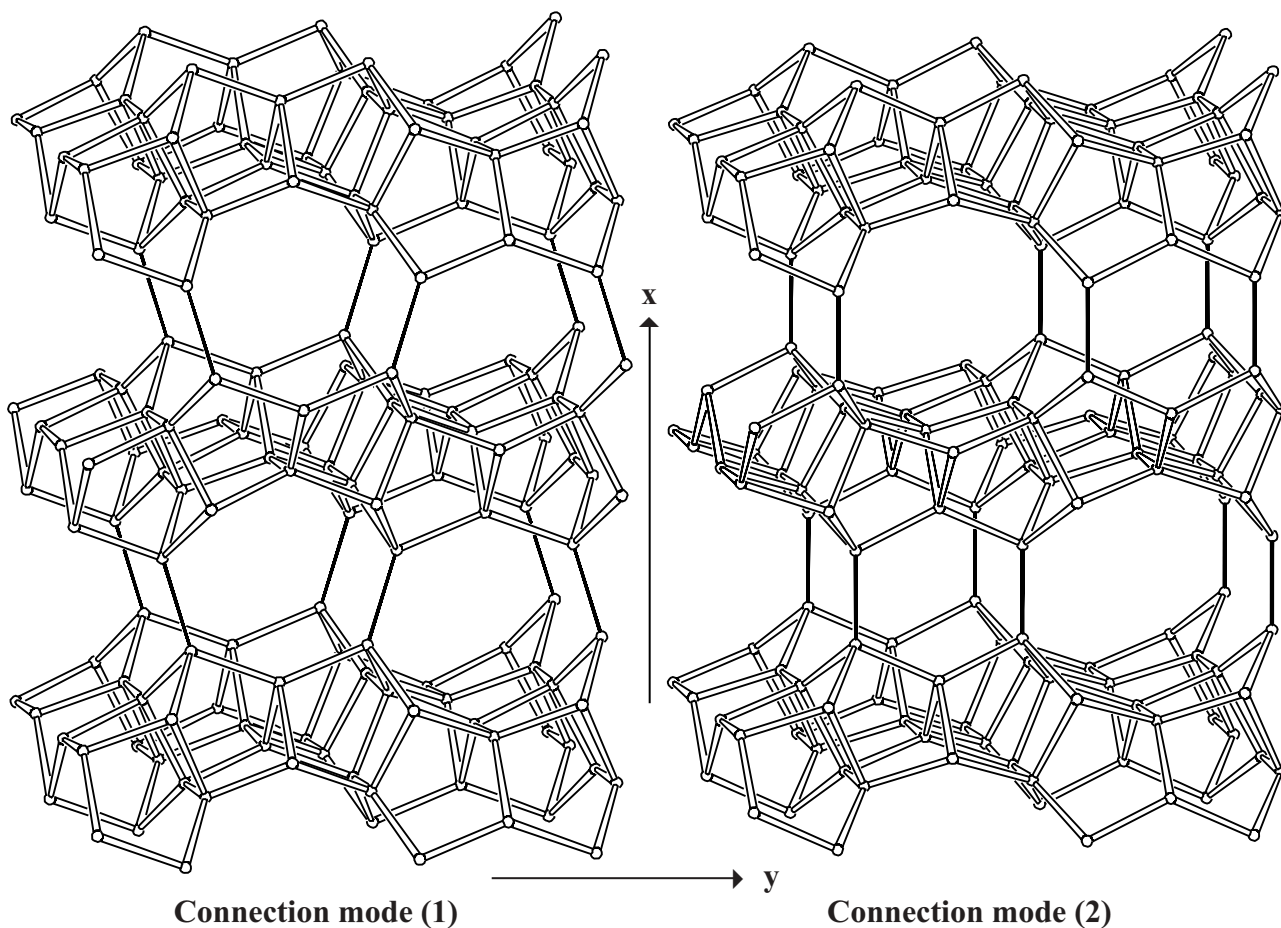


Figure 2. Connection mode (1) in CDO (left) and mode (2) in FER (right) viewed along  $z$ . ▲

### 3. Projections of the unit cell content:

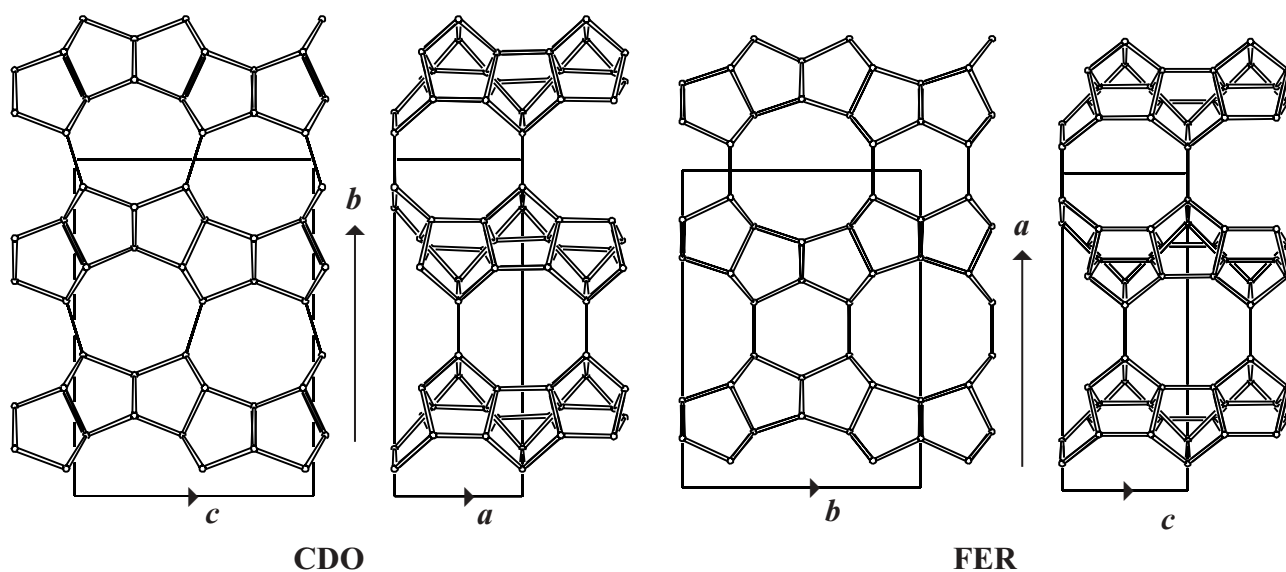


Figure 3. Parallel projections of the unit cell content in CDO (left) along  $a$  and along  $c$ , and in FER (right) viewed along  $c$  and  $b$ . The projections along  $c$  (in CDO) and along  $b$  (in FER) are equal. ▲

#### 4. Channels and/or cages:

Interconnecting one-dimensional channel systems are parallel to *a* and *c* in **CDO**, and to *b* and *c* in **FER**. The channel intersection in **CDO** consists of 5-, 6- and 8-rings. The intersection of channels in **FER**, composed of 6-, 8- and 10-rings, is topologically equivalent to the channel intersection in **DAC**. For each intersection the **pore descriptor** is added in Figure 3. In **FER** 10-ring channels, parallel to *c*, are interconnected along *b* through common 8-rings of cavities composed of fused 5- and 6-rings that are part of the wall of an 8-ring channel parallel to *b*.

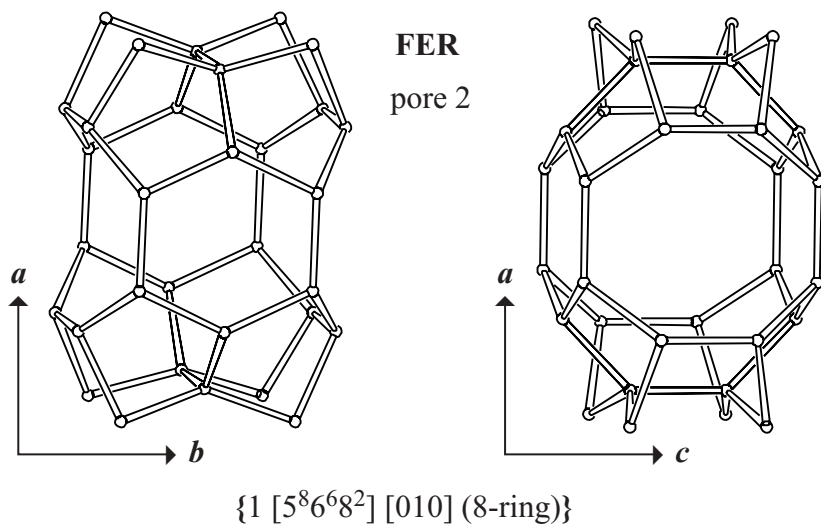
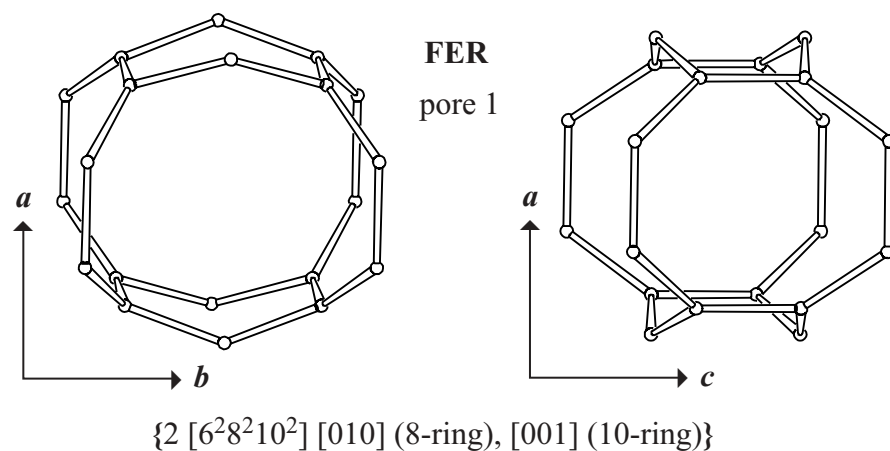
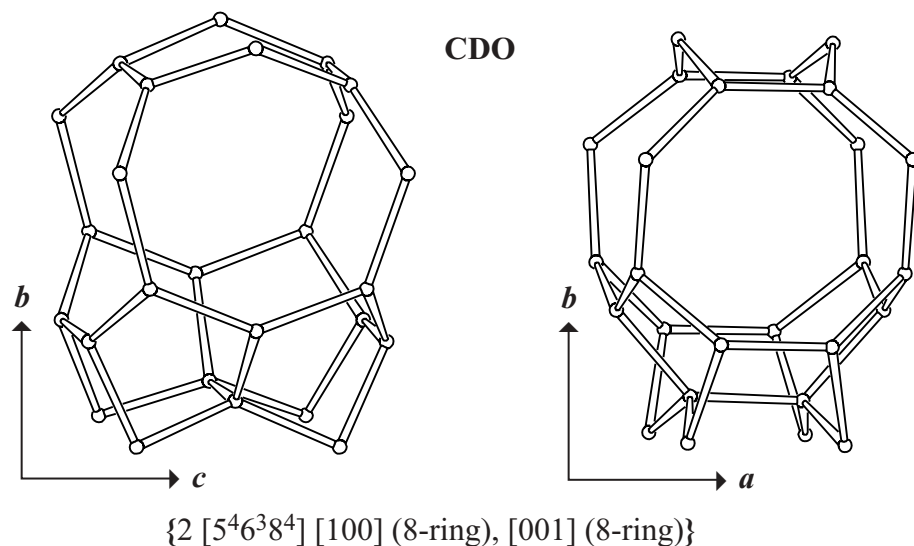
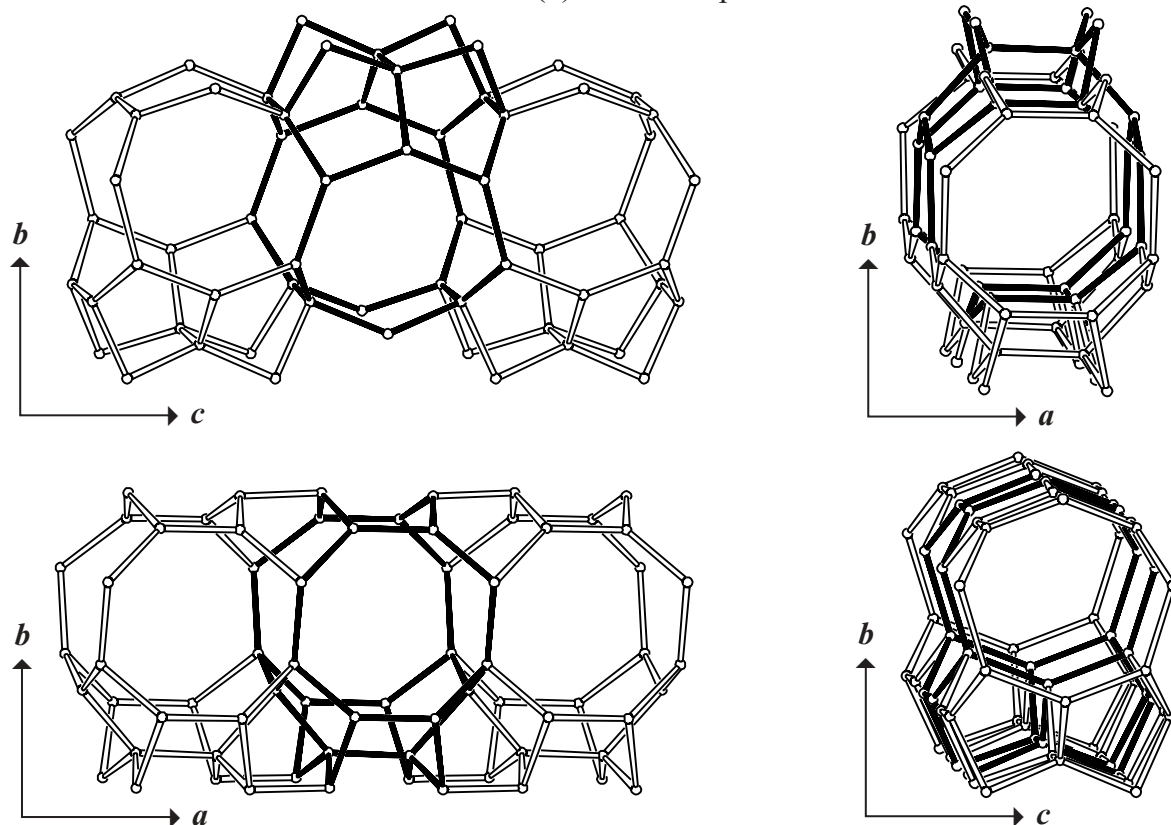


Figure 4. Channel intersection and pore descriptor in **CDO** (top) viewed along *a* (left) and *c* (right), and the two types of pores in **FER** (middle and bottom) viewed along *c* (left) and along *b* (right). [Figure 3 is continued on next page]

(a): Fusion of pores in CDO:



(b): Fusion of pores in FER:

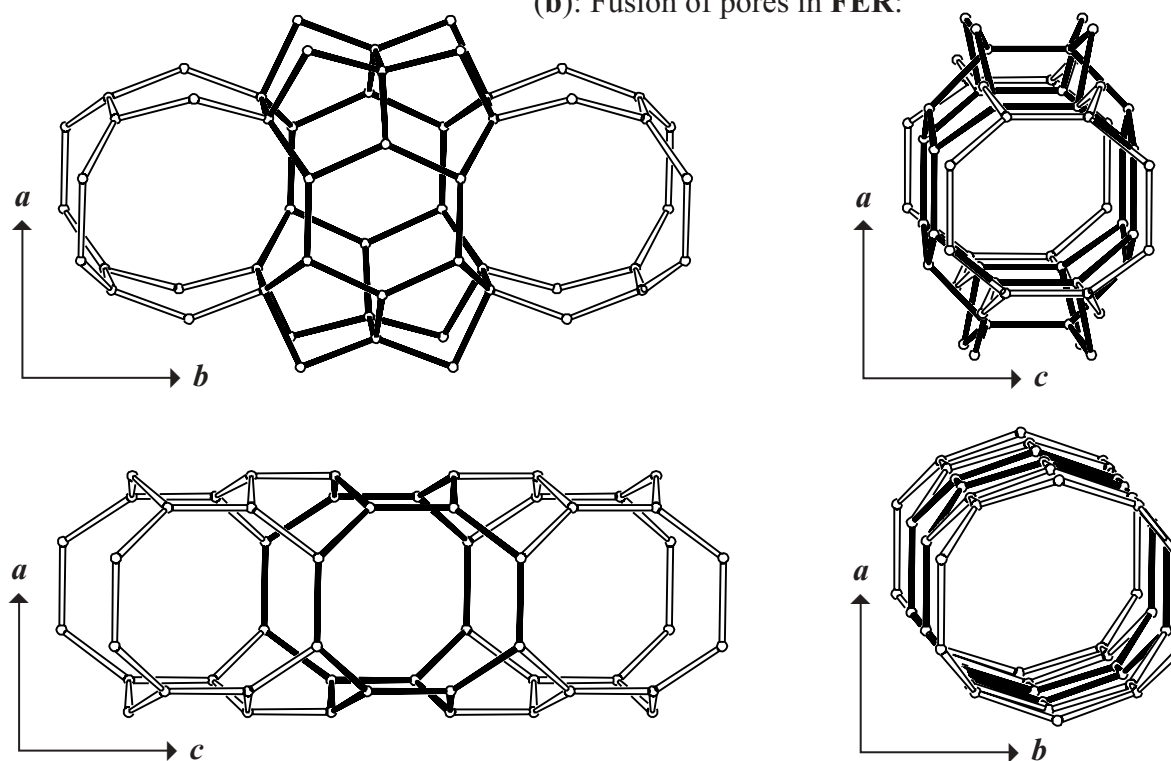


Figure 5. (a): Fusion of channel intersections in **CDO**. Fusion of intersections along  $c$  viewed along  $a$  (top left) and along  $c$  (top right), and fusion of intersections along  $a$  viewed along  $c$  (bottom left), and along  $a$  (bottom right); (b): Fusion of channel intersections in **FER**. Fusion of intersections along  $b$  viewed along  $c$  (top left) and along  $b$  (top right), and fusion of intersections along  $c$  viewed along  $b$  (bottom left) and along  $c$  (bottom right).



## 5. Supplementary information:

### *Other framework types containing saw chains*

In several framework types at least one of the unit cell dimensions is about  $n \cdot 7.5 \text{ \AA}$  (where  $n = 1, 2, 3 \dots$  etc.). In many cases this indicates the presence of saw chains.

In the **INTRO** pages links are given to descriptions of other framework types containing (twisted) saw chains (choose: **Saw chains**). 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 2**).

### *Alternative description using (modified) 5-rings*

Several framework types, like **CDO** and **FER**, 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**).

