The MTT/TON Family

1. The Periodic Building Unit (PerBU) is the layer shown in Figure 1. This layer is built from infinite building units, shown in Figure 2.
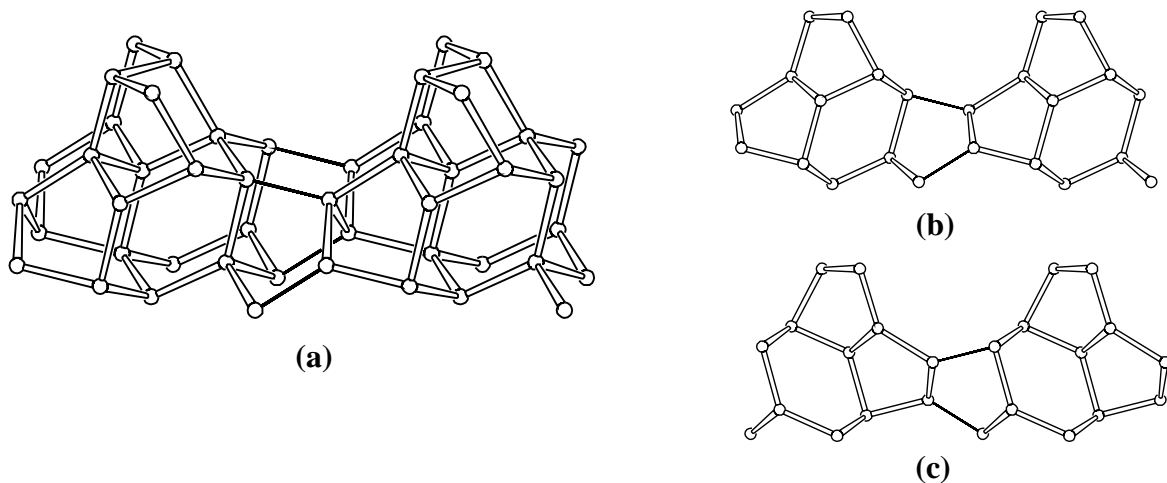

Figure 1: PerBU in the MTT/TON family of zeolite frameworks. (a): perspective view; (b) and (c): parallel projection along the zigzag chain axis

The PerBU in the MTT/TON family (Fig.1) is composed of infinite building units (Fig.2), related by pure translations. The PerBU's depicted in Figure 1b and 1c are identical and related by a rotation of 180º about the plane normal.
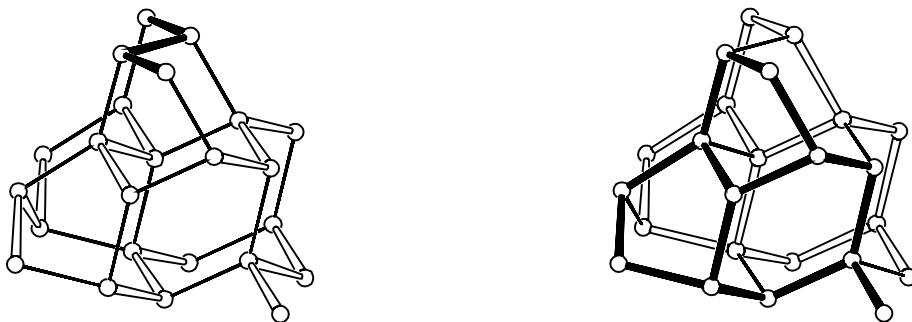

Figure 2: Infinite building unit constructed from six infinite zigzag (zz) chains running parallel to *a* (left) or from T12 units (right). For clarity only two repeat units along the zz chain axis are drawn. [Compare this building unit with the building unit in SFE constructed from seven zz chains]   ▲

2. Type of Faulting: 1-dimensional stacking disorder of the PerBU's along the PerBU-plane normal.

3. The Layer Symmetry: the plane space group of the PerBU is P m 1 (1). ▲

4. Connectivity Pattern of the PerBU:

Neighbouring PerBU's can be connected in two different ways:
(a): neighbouring PerBU's are related by a pure translation. The resulting connectivity exhibits inversion symmetry (**i**; **o**) between successive layers.
(b): neighbouring PerBU's are related by a rotation of 180º about the plane normal. The connectivity now shows mirror symmetry (**m**; **|**) between successive layers.
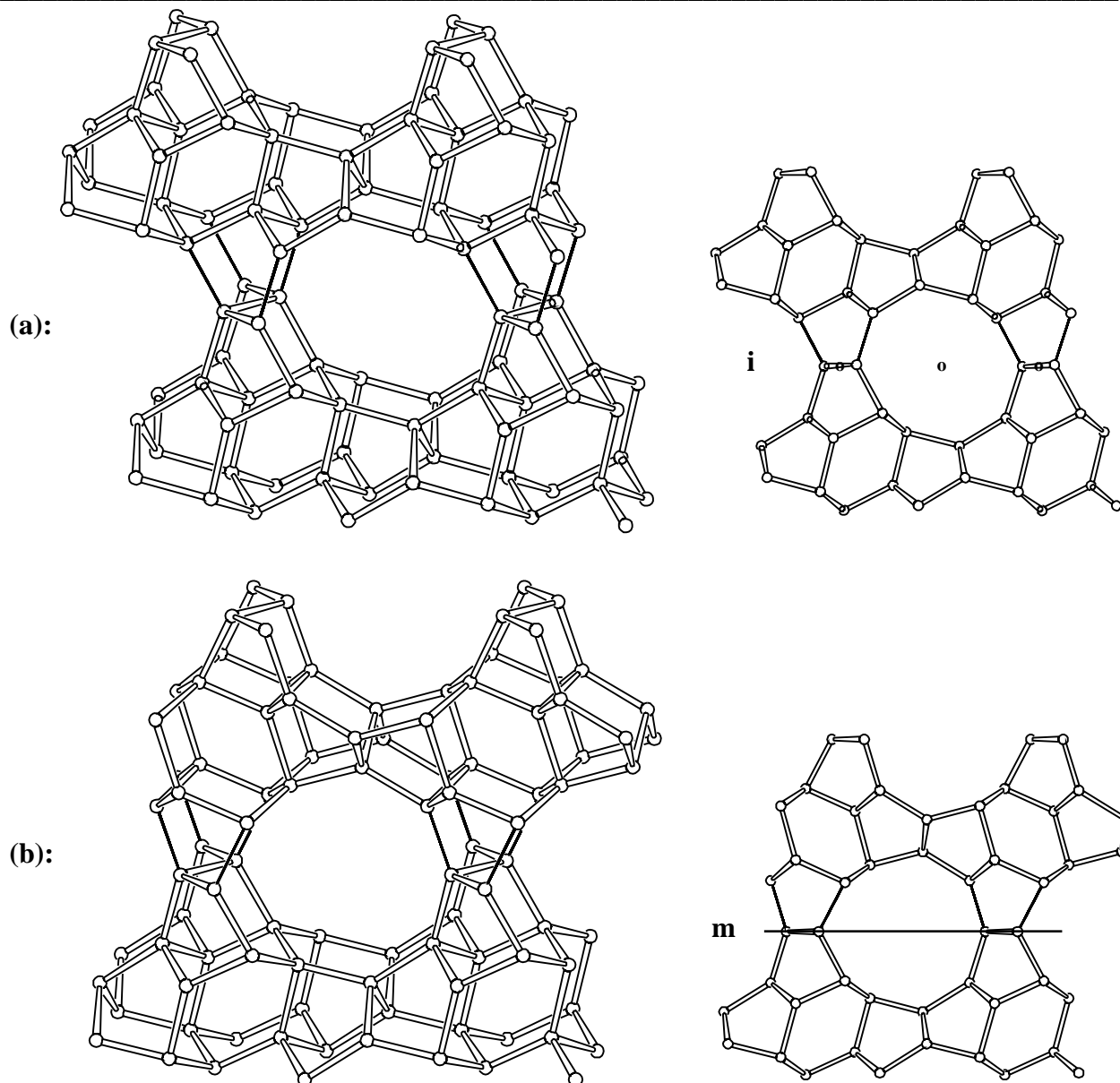

Figure 3: Perspective view (left) and parallel projection of the connection modes **(a)** and **(b)** in the MTT/TON family of zeolite frameworks seen perpendicular to the plane normal of the PerBU

Once the distribution of the symmetry elements **i** and **m** between the PerBU's is known, the 3-dimensional structure is defined. ▲

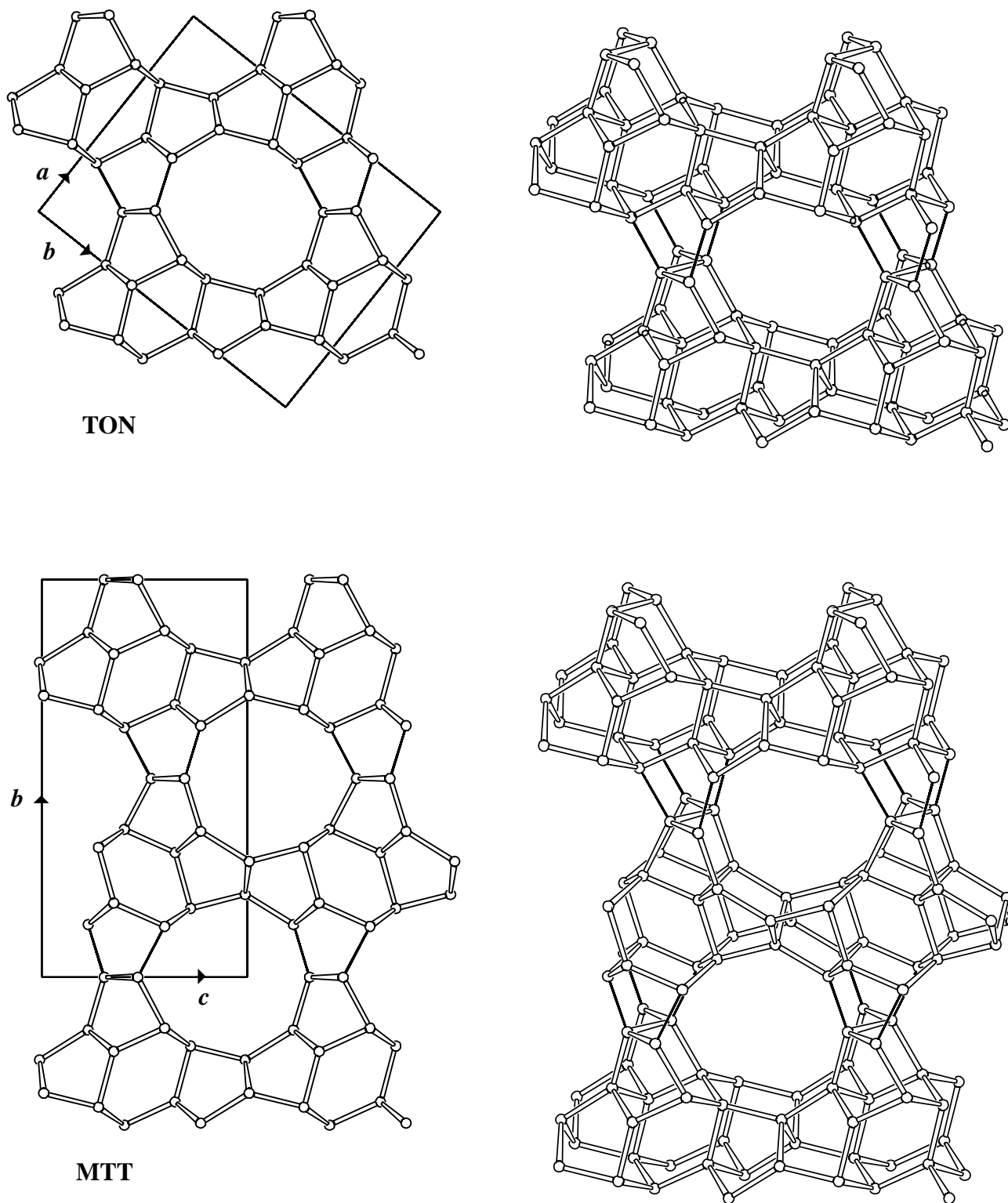**5. The Simplest Ordered End-Members** in the MTT/TON family are presented in Figure 4:

Figure 4: Perspective view and parallel projection along the zizag chain axis of the unit cell content of the two simplest ordered end-members in the MTT/TON family: TON (top) and MTT (bottom)

Pure TON(1,2) and MTT(3,4) are obtained when neighbouring PerBU's, stacked along the plane normal, are exclusively related by **i** and **m**, respectively.

6. Disordered Materials Synthesized and Characterized to Date:

to be added ▲

7. Supplementary Information

7.1 *Comparison with SFE:*

The PerBU in SFE is composed of infinite building units consisting of seven zz chains. PerBU's are connected after pure translations along the cell axes as shown in Figure 5. [For more details: see the building scheme of SFE in 'Schemes for Building Zeolite Framework Models' on http://www.iza-structure.org/databases/
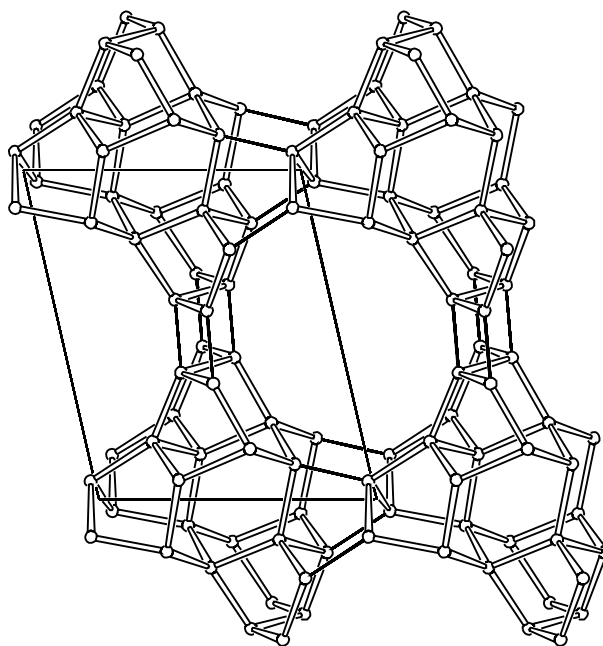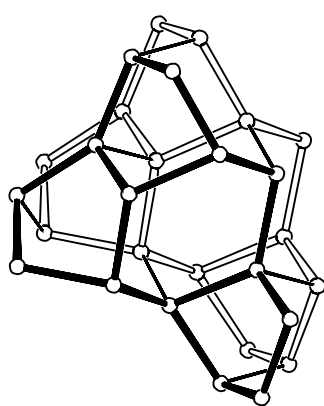

Figure 5: Infinite building unit, (top left) and perspective view (right) of the unit cell content of SFE

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8. References

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