

The ITE/RTH Family

1. The Periodic Building Unit (PerBU) - 2. Type of Faulting - 3. The Layer Symmetry
4. Connectivity Pattern - 5. Ordered End-Members - 6. Disordered materials synthesized to date
7. Supplementary Information - 8. References

1. The Periodic Building Unit (PerBU) equals the layer shown in Fig. 1a and b:

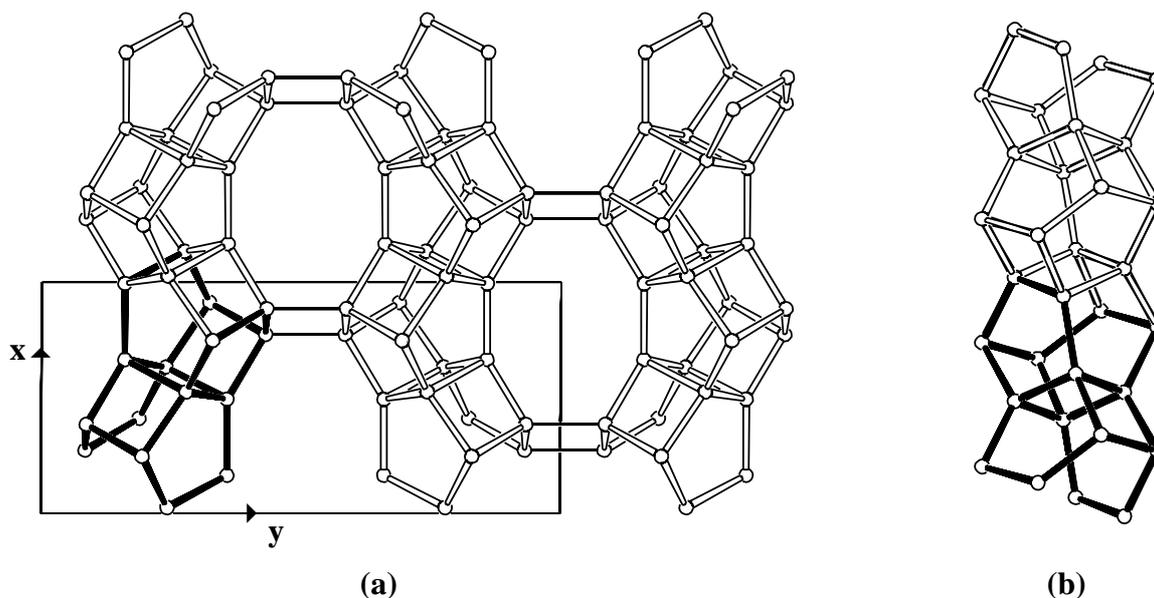


Figure 1: PerBU in the ITE/RTH family of framework types shown along z (a) and as a parallel projection along y (b)

T16-units (bold in Fig. 1a), consisting of three T4-rings and four T5-rings, are connected into chains after pure translations, a , along x . Chains, related by a shift vector of $1/2a$ (or by a mirror plane perpendicular to y), are connected along y to form the PerBU of the ITE/RTH family of zeolite framework types.

2. **Type of faulting:** 1-dimensional stacking disorder of the PBUs along $[001]$.

3. **The plane space group symmetry** of the PerBU is $C 1 m (1)$.



4. Connectivity pattern of the PerBU:

Neighbouring PerBU's are connected via O-bridges along **z** in two ways:

(a): successive layers are connected after a pure translation along **z**. The resulting connectivity exhibits inversion (**i: o**) symmetry.

(b): successive layers are connected after a 180° rotation about **x** (or **z**). The connectivity now shows mirror symmetry (**m: |**) between successive layers.

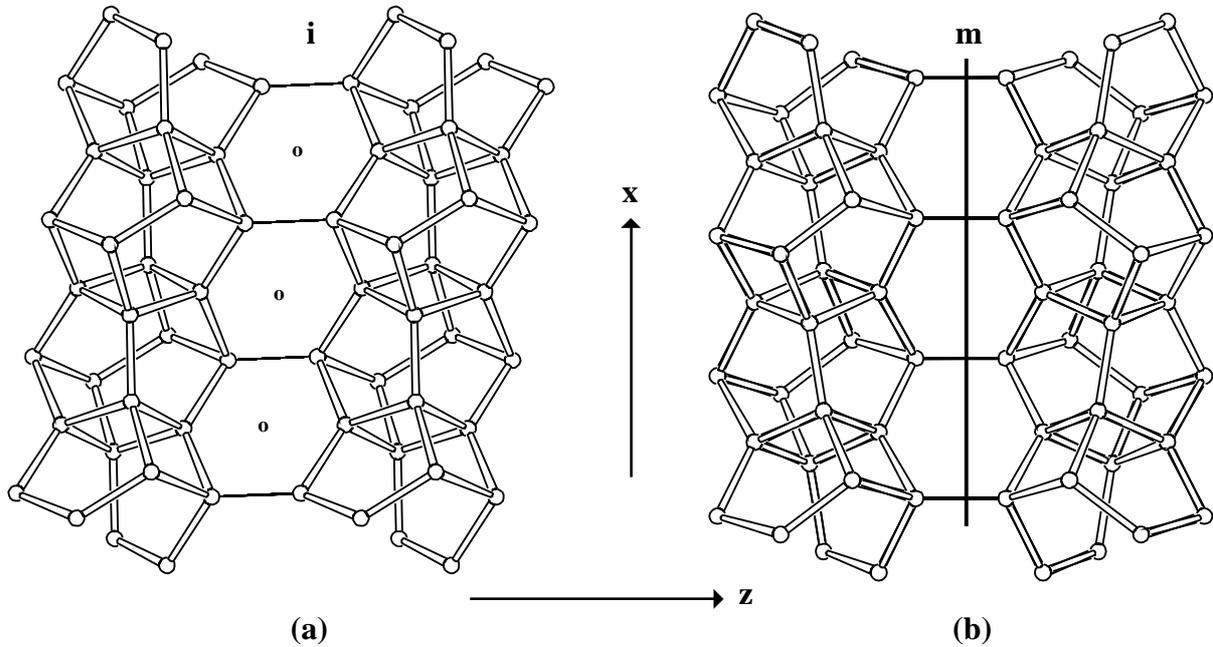


Figure 2: Connectivity of the PerBU shown parallel to the **xy**-plane

Once the distribution of the symmetry elements **i** and **m** along **z** is known the 3-dimensional framework is defined.

An example of an intermediate structure in the ITE/RTH family of zeolites is shown in Figure 3:

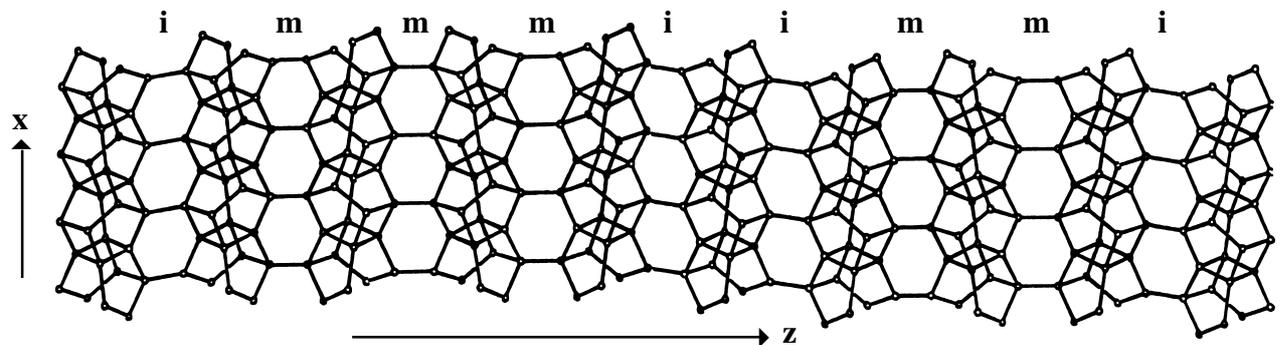


Figure 3: Connectivity sequence of PerBU's with **m** and **i** as symmetry elements

5. The simplest ordered end-members in the ITE/RTH family are presented in Figure 4:

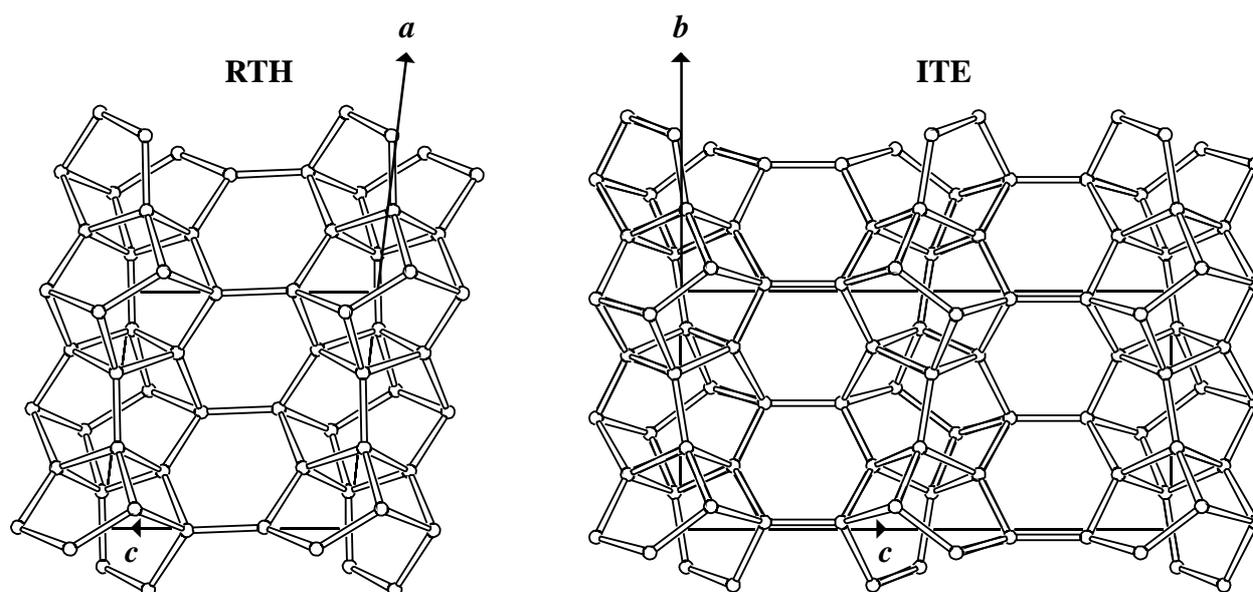


Figure 4: Parallel projection of the cell content of the two simplest ordered end-members in the ITE/RTH family seen along b in RTH (left) and along a in ITE (right)

Pure RTH (1) and ITE (2) are obtained by exclusively stacking neighbouring layers by i and m , respectively. ▲

6. Faulted materials synthesized and characterized to date:

SSZ-36 (3)

7. Supplementary material

to be added

8. References

- (1) S. Vortmann, B. Marler, H. Gies and P. Daniels, *Microporous Mater.* **4**, 111 (1995).
 - (2) M.A. Camblor, A. Corma, P. Lightfoot, L.A. Villaescusa and P.A. Wright, *Angew. Chem., Int. Edit. Engl.* **36**, 2659 (1997).
 - (3) P. Wagner, Y. Nakagawa, G.S. Lee, M.E. Davies, S. Elomari, R.C. Medrud and S.I. Zones, *J. Am. Chem. Soc.* **122**, 263 (2000).
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