The KFI/SAV Family

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1. The Periodic Building Unit (PerBU) equals the layer shown in Figure 1:

![Figure 1: The PerBU of the KFI/SAV family of zeolite frameworks shown parallel to c (a) and perpendicular to c (b and c)](image)

The PerBU of the KFI/SAV family of framework types, the tetragonal \( ab \) layer, is composed of double T6-rings (D6R’s; Fig.1 in bold). D6R’s, related by rotations of 180° about \( a \) and \( b \) (or by mirror planes perpendicular to \( a \) and \( b \)) are connected along \( a \) and \( b \), respectively, through T4-rings as shown in Figure 1. Projections of the PerBU along [001] (Fig.1a), [010] (Fig.1b and 1c) are shown. The layers, depicted in Figure 1b and 1c are identical and related by a 180° rotation about the plane normal, \( c \), or by a mirror operation perpendicular to \( c \). [Compare this \( ab \) layer with the D6R layers in the AEI/CHA and AEI/SAV families].

2. Type of Faulting: 1-dimensional stacking disorder of the PerBU’s along \( c \).
3. The Layer Symmetry: the plane space group of the PerBU is P (4) m m.

4. Connectivity Pattern of the PerBU:

Neighbouring PerBU’s are connected along $c$ through T4-rings in two different ways:
(a): neighbouring PerBU’s are related by pure translations along $c$. The resulting connectivity exhibits inversion symmetry (i: ) between successive layers.
(b): neighbouring PerBU’s are related by a mirror plane perpendicular to $c$ (or by a rotation of 180° about $c$). The connectivity now shows mirror symmetry (m: ) between successive layers.

Figure 2: Perspective view (left) and parallel projection (right) along $b$ of the connection modes (a) and (b) in the KFI/SAV family of zeolite frameworks

Once the distribution of the symmetry elements i and m between the layers stacked along [001] is known, the 3-dimensional structure is defined.
5. **The Simplest Ordered End-Members** in the KFI/SAV family are shown in Figure 3:

![Figure 3: Projection of the unit cell content along b of the two simplest ordered end-members in the KFI/SAV family: KFI (left) and SAV (right)](image)

Pure KFI (1) and SAV (2) are obtained when neighbouring PerBU's, stacked along c, are exclusively related by m and i, respectively.

6. **Disordered Materials Synthesized and Characterized to Date:**

No disordered materials known to date.

7. **Supplementary Information**

7.1 *Comparison with the AEI/CHA family:*

The PerBU in the AEI/CHA family is composed of D6R’s, related by pure translations along the diagonals in the xy plane as shown in Figure 4.

![Fig.4: PerBU seen along the plane normal n (a) and along y (b). The layers in Fig.4b are related by a rotation of 180° about the plane normal n or by a mirror operation perpendicular to n](image)
For more details: see the description of the AEI/CHA family in this 'Catalog'.

7.2 Comparison with the AEI/SAV family:

The PerBU in the AEI/SAV family is composed of D6R’s, related by rotations of 180° about x and by pure translations along y as shown in Figure 6.
For more details: see the description of the AEI/SAV family in this 'Catalog'.

8. References
