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## **Influence of polytype formation and Al and Si ordering on the crystal structure in $\beta$ -Al<sub>4.5</sub>FeSi**

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$\beta$ -Al<sub>4.5</sub>FeSi frequently occurs in recycled Al-Si alloys. Unsolved issues of the atomic structure obstructs its analysis in the materials. New crystal structures of  $\beta$ -Al<sub>4.5</sub>FeSi including polytype formation and ordering of Al and Si atoms are presented. Furthermore, the present study reconciles experimental results, own and from literature, additionally to evidence from DFT calculations to conclude on unsolved issues of the structure interpretation with consequences at all microstructural levels.

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