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# Vicinal Faces on Synthetic Goethite Observed by Atomic Force Microscopy

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**Abstract:** In this paper atomic force microscopy-studies are reported suggesting the existence of vicinal faces on the (100) plane of artificially grown goethite. Goethite crystals are commonly regarded to have boundary planes of (100), (010) and (001) faces. In contradiction to these theoretical models TEM and SEM images exhibit (110) and (021) faces to be dominating. These goethite particles consist of many crystallographic coherent domains so that the existence of dislocations on the surfaces has to be assumed. These sites on the surfaces may serve as a nucleation site for the formation of steps. The vicinal faces on the (100) face found with the AFM are (021) faces. They influence the growth velocity of the (100) face to such a degree, that this face vanishes and only (110) faces remain as stable boundary surfaces. The (021) faces are also stable, but have the highest growth rate among the faces considered.

**Key Words:** Atomic Force Microscopy • Crystal Growth • Goethite

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