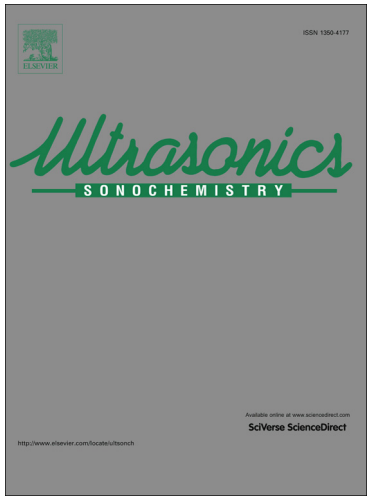

Review

Applications of Ultrasound to Chiral Crystallization, Resolution and Deracemization

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Title: Applications of Ultrasound to Chiral Crystallization, Resolution and Deracemization

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Abstract: Industrial synthesis of enantiopure compounds is nowadays heavily based on the separation of racemates through crystallization processes. Although the application of ultrasound in solution crystallization processes (sonocrystallization) has become a promising emerging technology, offering several benefits (*e.g.* reduction of the induction time and narrowing of the metastable zone width, control over the product size, shape and polymorphic modification), little attention has been paid so far to the effects of ultrasound on chiral crystallization processes. Several recent studies have reported on the application of acoustic energy to crystallization processes that separate enantiomers, ranging from classical (diastereomeric) resolution and preferential crystallization to new and emerging processes such as attrition-enhanced deracemization (Viedma ripening). A variety of interesting effects have been observed, which include among others, enhanced crystallization yield with higher enantiomeric purity crystals, spontaneous mirror symmetry breaking crystallization, formation of metastable conglomerate crystals and enhanced deracemization rates. The objective of this review is to provide an overview of the effects of ultrasound on chiral crystallization and outline several aspects of interest in this emerging field.