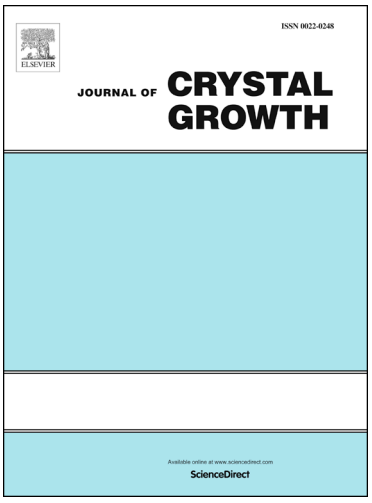

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On questionable ferroelectric and piezoelectric properties in single crystals

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Abstract

In this short review, a critical analysis of the purported ferroelectric and piezoelectric properties of crystals which have been published is critiqued.

1. Introduction

Several papers have been published in peer-reviewed journals, especially in the journals devoted to investigations of materials, which have presented some misconceptions concerning the formation and properties of ferroelectric and piezoelectric crystals. For example, in numerous publications the assumption that if two substances are dissolved in water at the ratio 1:1, a new compound will crystallize that will contain these substances at the same ratio. This assumption is almost always incorrect and any new compound needs to be subjected to elementary chemical analysis and X-ray structural determination. Without such procedures, a verified composition of the obtained crystal is impossible. If presented, the elemental chemical analysis is incomplete in limited to a few of the elements present in this "new" crystal. Typically, authors can claim that narrow diffraction peaks in a powder pattern reflect a perfect crystallographic structure. Such conclusions are often incorrect.

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