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PII: S0022-0248(17)30533-X
DOI: http://dx.doi.org/10.1016/j.jcrysgro.2017.08.035
Reference: CRYS 24286

To appear in: *Journal of Crystal Growth*

Received Date: 8 June 2017
Revised Date: 30 August 2017
Accepted Date: 31 August 2017

Please cite this article as: S. Singaravadivelu, A. Uthayakumar, S.T. Abraham, Ultrasonic study of elastic anisotropy of unidirectional Rochelle salt single crystals grown using the Sankaranarayanan-Ramasamy method, *Journal of Crystal Growth* (2017), doi: http://dx.doi.org/10.1016/j.jcrysgro.2017.08.035

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Abstract:

Sodium potassium tartrate tetrahydrate-$NaKC_4H_4O_6.4H_2O$ known as Rochelle salt is a well-known ferroelectric. This paper deals with the following topics: (i) the Sankaranarayanan-Ramasamy method of growth of a parallelepiped-shaped single crystal of Rochelle salt having the (100), (010) and (001) planes mutually perpendicular to each other, (ii) evaluation of the second-order elastic stiffness constants C_{11}, C_{22}, C_{33}, C_{44}, C_{55} and C_{66} using the parallelepiped-shaped single-crystal sample of Rochelle salt, (iii) growth of large [011]-, [101]- and [110]-oriented cylindrical-shaped single crystals of Rochelle salt from appropriately prepared seeds using the same method, (iv) determination of elastic constants C_{23}, C_{13} and C_{12}using the [011]-, [101]- and [110]-oriented single-crystal samples of Rochelle salt, respectively, and (v) calculations of elastic compliance constants S_{11}, S_{22}, S_{33}, S_{44}, S_{55}, S_{66}, S_{12}, $S_{23}$and S_{13}, Young's modulus E, bulk modulus K, Poisson's ratio υ, linear compressibility β_1, $\beta_2$and β_3 along the three principal directions and volume compressibility β of the crystal.