

RESEARCH ARTICLE

Synthesis of ULA Nonlinear optical material with EDTA impurities at room temperature

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ABSTRACT

Crystal growth is an important field of material science, which plays a vital role in modern science and technology. Fast changes are occurring in the field of science and technology, yesterday technology is becoming waste for today. The fast changes in field are only due to crystal growth techniques and impact of impurities in pure and impure materials. Today crystal have crossed many traditional boundaries and becoming basic pillars for modern electronics.

Nonlinear optics has wide applications in the field of optical communication, telecommunication, information technology, optical information storage devices and others. For presents study a nonlinear optical Urea - L- aline acid and Urea L-arganine acid with EDTA impurities at room temperature has been tried and born crystal has been characterized by usually I R techniques, a well-developed highly transparent, and stable crystal of Urea L-aline acid and Urea L-arganine acid with EDTA impurities at room temperature can be successfully synthesized.

Key words: Crystal growth, synthesis, impurities, NLO, room temperature

INTRODUCTION

Crystal growth is an important field of material science, which plays a vital role in modern science and technology. They are used as excellent source of scientific studies. Fast changes are occurring in the field of modern science and technology, yesterday technology is becoming waste for today. The fast changes in field are due to crystal growth techniques and impact of impurities in pure and impure materials and growth of pure single crystal from various impure materials.

Today crystals have crossed many traditional boundaries and becoming basic pillars for modern electronics. The invention of transistor brought the change from crystal for science to crystals for technology. Many national and international industries of developing and developed countries are now interested in research of this field.

Usually crystals are grown in solids forms with different symmetry and original groups. But the crystals having center of symmetry are very much important properties in piezo electric devices, high capacity condensers and electronic components. Modern technology is based on single crystals of nonlinear optical, ferroelectrics, semiconductor, super conductor and aousto-optic materials. Cheapest and easiest way in which a pure substance can be obtained from impure material solutions. The significant advancement in crystal growth technology has allowed the development of many excellent crystals to meet ever-growing applications in lasers. Optical communication, data storage devices, astronomical, information technological, industrial, medical and others, Hence growth of single crystal from various impure materials with different impurities becomes inevitable for future research in material science. Because many crystals have several applications in optical components, semiconductor devices, solar cells etc [1].

Nonlinear optical materials capable of efficient second harmonic generation have been actively sought over the last three decades. Due to commercial importance of these materials of these materials are used in optical

communication, signal processing sensing and instrumentation [2].

Usually the general requirement of NLO material is

1. Fast and quick optical response
2. Wide transparency range
3. Nontoxic, good environmental stability
4. Wide phase matching angle
5. Large damage threshold frequency
6. High mechanical strength with high thermal stability
7. Cheap in cost, easy to grow, easy to use etc.

For present study, a nonlinear material Urea L - aline acid and Urea L- arganine acid with EDTA impurities at room temperature has been tried and grown crystals are characterized by usual IR techniques. A well developed, highly transparent and stable crystal with sufficiently mechanical strength, pure material at room temperature is synthesized. Whose results obtained procedure is given?

METHODOLOGY

1. A Urea extra pure (loba chemic Pvt. Ltd. Mumbai)
2. L - Arginine (Loba chemic Pvt. Ltd. Mumbai)
3. L - Alanine (Loba chemic Pvt. Ltd. Mumbai)
4. EDTA (Loba chemic Pvt. Ltd. Mumbai) with different

Combinations are added and well stride on magnetic stirrer till clear solution is obtained, All 1-4 solutions with different combinations are added & solutions are kept for crystal growing as per table no. 1.1& 1.2.

Table 1.1: Urea L-Alanine with EDTA Chemical combination of

Sr. No.	Sample No.	Urea gm	L-Alanine gm	EDTA gm
1	1	20	0.25	4
2	2	20	0.5	4
3	3	20	0.75	4
4	4	20	1.0	4

Table 1.2: Chemical Combination of Urea L-Arginine acid with EDTA

Sr. No.	Sample No.	Urea gm	L-Alanine gm	EDTA gm	PH
1	5	18	1	1 gm	6.96
2	6	18	0.8	1.2	6.70
3	7	18	0.6	1.4	6.67
4	8	18	0.4	1.6	6.56
5	9	18	0.2	1.8	6.60
6	10	10 gmUram + 15 ml sample no. 1 solution			

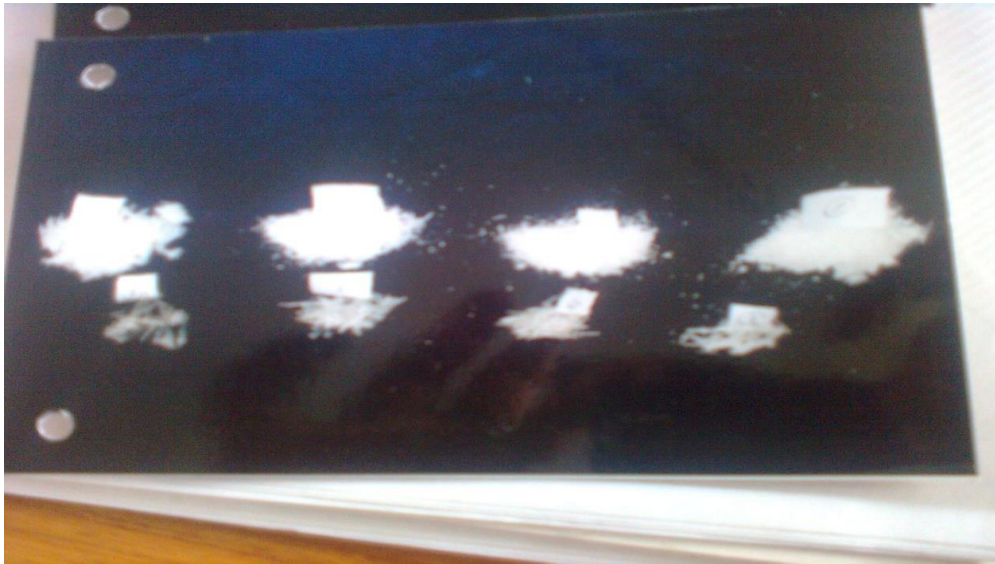


Fig 1. Well-developed ULA crystals grown at room temperature



Fig 2. Well-developed ULA crystals grown at room temperature

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RESULTS AND DISCUSSION

1. Well-developed crystals with sufficient mechanical strength are obtained within 3 month.
2. Grown crystals are having high transparency & high environment Stability.

Conflicts of interest: The authors stated that no conflicts of interest.

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