

Growth and Characterisation – XRD, NLO of Bis 2 Amino Pyridinium Maleate (B2APM) crystals

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Abstract

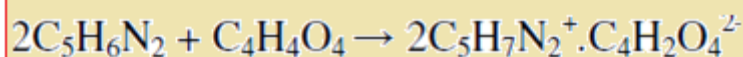
Bis 2 Amino Pyridinium Maleate (B2APM) crystals are NLO in nature and are grown by solution growth method, since NLO materials are widely used for number of variety of applications such as ease of fabricating, high stability and wide range of transparency of light; they are proposed to be grown as the titled specimen. The single XRD data confirms that this crystal is having a as 21.760 Å, b as 23.555 Å, c as 5.626 Å, $\alpha = \beta = \gamma = 90^\circ$ and the crystal is orthorhombic in nature, Fdd2 is the space group of Bis 2 Amino Pyridinium Maleate crystals. Structure is the combination of $2C_5H_7N_2^+.C_4H_2O_4^-$. NLO is of 4.2 times that of KDP.

Key Words: B2APM, XRD, NLO, FLUORESCENCE SPECTRUM ...

Experimental

The B2APM was prepared by suspend 2-aminopyridine and maleic acid in 2:1 molar ratio in water at 100°C. Crystals of B2APM were acquired by slow evaporation of the solvent at the room temperature.

The reaction mechanism is



NLO

The second order NLO property of B2APM crystals are confirmed by Kurtz Perry method and is nearly 4.2 times that of KDP crystal as the indication one. Table 1 gives the comparison of relative SHG efficiency of maleate crystals with KDP.

Table.1 Comparison of relative SHG efficiency of maleate crystals

Crystal	SHG efficiency (KDP = 1)
Picolinium maleate	0.4
L-alaninium maleate	1.5
L-arginine maleate dihydrate	3
2-aminopyridinium maleate	3.5
Bis 2 Amino Pyridinium Maleate (Present work)	4.2

Conclusion

B2APM crystals are grown by slow evaporation method and here the grown material is subjected to XRD, NLO and FL and from that it is orthorhombic in nature. The single XRD data confirms that this crystal is having a as 21.760 Å, b as 23.555 Å, c as 5.626 Å, $\alpha = \beta = \gamma = 90^\circ$. The second order NLO property of B2APM crystals are confirmed and is nearly 4.2 times that of KDP crystal and is higher value than all other maleate crystals.

References:

1. Buckley.H.E, Crystal Growth', Chapman and Hall, London (1952)
2. Elmer.T.H, Am.Ceram.Soc.Bull.32,23, (1953)
3. Cabrera.N, Levine.M.M, Phil.Mag. 1,450, (1956)
4. Campbell.J.E, High Temperature Technology, Wiley, New York, (1959)
5. Adamski.J.A, J.Appl.phys,36,1784,(1965)
6. Bennema.P, Ph.D Thesis, Tech. Univ. Delft, Groningen, Netherlands (1965)
7. Bravais.A, Etudes Cristallographique, Paris, Cauthier Villars, (1966)
8. Bennema.P, Kern.R and simon.B, Phys.Stat.Sol.19,211,(1967)

9. Adamski.J.A, powell.R.C and Sampson.R.L, ICCG Brmingham, 246,(1968)
10. Cockayne.B and Gasson.D.B,J.Materials Sci. 5,837,(1970)
11. Eickhoff.K and Gurs.K. J.Crystal Growth, 6,21,(1970)
12. Ankrum.P.D, Semiconductor Electronics, prentice-Hall, Jersey, (1971)
13. Domey.K.F, Solid State Tech.41 (1971)