# TABLE OF CONTENTS

1 Introduction

1.1 Crystals and Crystal Growth  
1.2 Crystal Structure  
1.3 Crystal Growth Techniques  
1.4 Crystals for Modern World  
1.5 Nonlinear Optics  
1.6 Scope of the Thesis  

2 Review of Literature

2.1 Introduction  
2.2 Trends in Optical and NLO Materials Development  
2.3 Inorganic and Organic NLO Crystals  
2.4 Semi-organic NLO Crystals  
2.5 Amino Acid Complex Crystals  
2.6 Earlier Reports on Beta Alanine  
2.7 Earlier Reports on Beta Alanine Compounds  
2.8 Earlier Reports on Amino Acid Admixed Phosphate Crystals  
2.9 Conclusion
3 Characterization Tools and Techniques

3.1 Powder X-ray Diffraction (PXRD)
3.2 Single-crystal X-ray diffraction (SC-XRD)
3.3 Fourier Transform Infrared Spectroscopy (FTIR)
3.4 CHNS Elemental Analysis
3.5 UV-Vis Spectroscopy
3.6 Photo Luminescent Spectroscopy
3.7 THERMAL ANALYSIS
3.8 Microhardness Analysis
3.9 Second Harmonic Generation by Kurtz Powder Technique
3.10 Dielectric Studies
3.11 Conclusion

4 Results and Discussion

4.1 Studies on Pure Beta Alanine Single Crystals
4.2 Studies on Beta Alanine Cadmium Chloride (BACC) single Crystals
4.3 Studies on Beta Alanine Potassium Chloride (BAPC) Crystals
4.4 Studies on Beta Alanine Lithium Sulphate (BALS) single Crystals
4.5 Studies on Beta Alanine Admixed ADP (BADP) single Crystals
4.6 Studies on Beta Alanine Admixed KDP (BKDP) single Crystals
5 Summary, Conclusions and Future Scope 161

5.1 Summary and Conclusions 161

5.2 Future Scope 165

Bibliography 167

Appendixes 188

6.1 A. Resume of the Candidate 188

6.2 B. List of Publications by the Candidate 188

6.3 C. The Paper Published in International Journal 193