$^{4}F_{3/2} \rightarrow ^{4}I_{11/2}$ in Nd$^{3+}$ doped SBN ceramic systems could be a potential candidate for various photonic applications.

Chapter 6 discusses the nonlinear absorption behavior of pure SBN and rare earth (Eu$^{3+}$ and Nd$^{3+}$) doped SBN nano ceramic systems which has been investigated employing the open aperture Z-scan technique using 532 nm, 5 ns laser pulses. The effective three-photon anano ceramic systems. The three-photon absorption coefficients of pure SBN, SBN:Eu and SBN:Nd bulk ceramic systems were also calculated as $1.2 \times 10^{-23}$ m$^3$/W$^2$, $5.8 \times 10^{-23}$ m$^3$/W$^2$ and $9.1 \times 10^{-23}$ m$^3$/W$^2$ respectively. It is found that these materials are potential optical limiters at this excitation wavelength.

Chapter 7 describes the conclusion and future scope of works. This chapter sums up the salient features of the work described in this thesis and the scope for potential investigations in this field.

The research work presented in the thesis has either been published or communicated to reputed peer reviewed international journals, conference proceedings and presented in various national/international seminars

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