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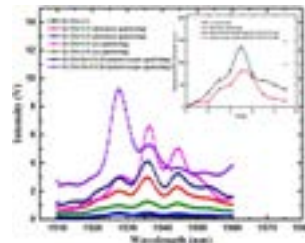
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## Infrared photoluminescence analysis and optimization of erbium-ytterbium silicate films under the different sputtering method

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In recent years, erbium silicate compound has aroused considerable research as erbium-based materials for small size and high gain light sources in silicon photonics integration, since it contains a high erbium concentration that has no insolubility problem. In addition, ytterbium cations are usually added to the erbium silicate to prevent neighboring erbium ions from causing cooperative upconversion and also act as sensitizers. Methods have been utilized for depositing erbium-ytterbium silicate films include the sol-gel method, sputtering and pulsed laser deposition. Compared with other deposition methods, magnetron sputtering has the advantages of fast deposition rate, high purity, good compactness, good uniformity and strong controllability which has gained rapid development and wide application. There are three main sputtering methods for erbium-ytterbium silicate films: co-sputtering, multi-layer alternating sputtering and mixed-target sputtering. Although each of them has its own advantages and disadvantages, their systematical researches and comparisons are not enough. In this paper, a series of erbium-ytterbium silicate films with different compositions were prepared by co-sputtering, multi-layer alternating sputtering and mixed-target sputtering. Several analysis and optimization of the films were given to systematically compare three different sputtering methods, which includes the photoluminescence intensity, crystal structure and luminescence lifetime. The results have laid the foundation for the erbium silicate light source devices preparation.



### Biography

Peiqi Zhou has completed his Bachelor's degree in the year 2016 at the age of 22 years from Wuhan University, Wuhan, China. He is now a PhD student of Prof Xingjun Wang from Peking University, Beijing, China. He has published about 2 papers on international journals and conference proceedings.

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