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A review on nanostructured glass ceramics for promising application in optical thermometry

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ABSTRACT: Currently, non-contact optical thermometry has attracted great attention for its promising applications in the electromagnetically and/or thermally harsh environments. In this review article, we provide an overview of the most recent progresses in glass ceramics based optical thermometric media. Fundamental principles for fluorescence intensity ratio and lifetime-based temperature sensing are provided and several glass crystallization strategies are discussed. The development of typical Ln^{3+} doped glass ceramics, Cr^{3+} doped glass ceramics and the related dual-phase glass ceramics for the achievement of fluorescence intensity ratio, lifetime-based and dual-modal temperature sensing will be systematically summarized. In the end, the conclusions and perspectives for this related topic are given.

Keywords: Optical materials; Glass ceramics; Optical thermometry; Upconversion; Luminescence

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