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### Optical applications of single crystals and transparent ceramics fabricated by high pressure process

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Tremendous efforts over the past six decades has led to huge progress in advanced solid state and fiber lasers for energy and power scaling. In the present scenario, solid state crystal lasers though are ideal for applications, primarily in terms of compactness and user friendly, these types of crystals are difficult to be grown due to the high temperature growth issues, which limit size and quality. Though transparent ceramics have low transmittance than single crystals has higher mechanical strength and large flexibility to fabricate into complex shapes. Transparent ceramics processing with nano sized ceramic powders and advanced densification technology provides an alternative approach to overcome the disadvantages/limits of conventional single-crystal growth methods. It would be much easier to elaborate polycrystalline ceramics with a full densification state and a homogeneous chemical composition under sintering temperature much lower than its melting point with a relative low cost and size flexibility. We at ICMCB have demonstrated successfully the fabrication of transparent ceramics of both cubic and non-cubic crystal structured materials by combining the high sinter ability of nano crystalline (nc) powders with the rapid densification rates characteristic of spark plasma sintering (SPS). Further single crystals obtained by hydrothermal technique with their principle and optical applications will be discussed. An overview of transparent ceramics and single crystals obtained by high pressure techniques for various optical applications will be discussed in detail.

#### Biography

Mythili Prakasam obtained her PhD from Anna University Chennai, India in 2009. She joined Institut de Chimie de la Matière Condensée de Bordeaux (ICMCB)-CNRS, Pessac-33608, France in 2009 and has been working till date at ICMCB. She has published more than 30 papers in reputed journals.

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