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Synthesis and characterization of glasses containing semiconductor quantum dots.

Dr. D. D. Ramteke is working as a Post-doctoral fellow at Department of Physics, University of the Free State, Bloemfontein, South Africa. He completed his PhD from Visvesvaraya National Institute of Technology, Nagpur, India. He published number of paper on rare earth containing glasses in various reputed journals. He visited countries like USA and Poland to present his work in conference on glasses. He is presently working on the glasses containing semiconductors quantum dots and up-conversion in glasses.

Throughout history, materials have transformed society and culture. There was the Stone Age, the Bronze Age, and the Iron Age. This is the Glass Age. Glass is most fascinating materials and attracted much interest both scientifically and technologically since it is transparent, chemically inert and ecofriendly. The also provides the simplicity in manufacturing, isotropic properties and wide variety of possible compositions. Use of rare earths (REs) elements or lanthanide in glasses makes them feasible to design various electro-optic and optical devices like lasers, color displays, amplifiers and solid state light devices.

Along with the rare earth ions, semiconductor nanoparticles have unique size dependent optical properties, which are having upmost significance in optoelectronics. Semiconductor nanoparticles with size of a few nanometers in a glass matrix shows an attractive properties and completely different from bulk materials because of quantum confinement effect, in which electron and hole wave functions are confined by deep potential well provided by glass matrix.

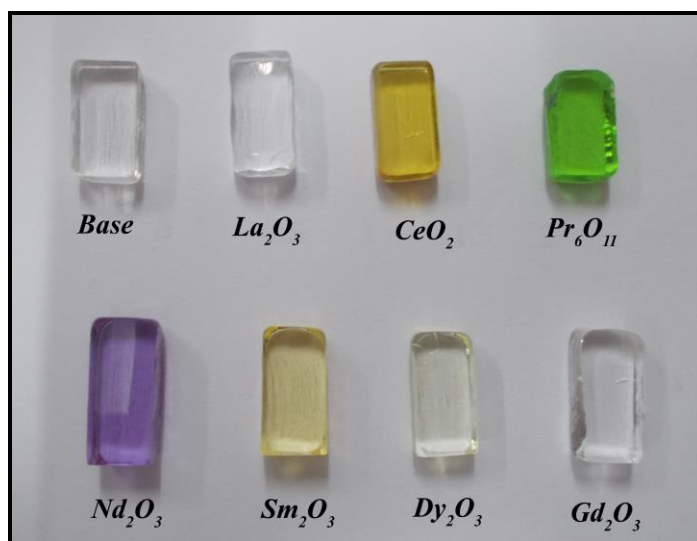


Fig. 1: Different rare earth oxide containing glasses