Abstract

Perovskite nanocrystals have emerged as a potential candidate in the field of optoelectronics specifically in next-generation backlit displays, LEDs, etc. Towards this goal, research is being carried out to synthesize stable perovskite NCs which can emit light entire the visible wavelength range. Here, in this thesis, we describe a protocol comprising perovskite NCs and Carbon quantum dots composite which emits white light upon UV light irradiation. Throughout the thesis, we have described the existing protocol in the literature, our approach and finally establishing the synthetic protocol to generate a white light emitting solution. Detailed characterizations including UV-vis, steady-state and time-resolved photoluminescence studies, XRD, electron microscopic characterizations were done to understand the processes involved therein.

In another attempt, we carried out research on antimony double perovskite-based systems in order to get rid of toxic and air and moisture sensitive Pb 2+ based perovskites. This thesis describes two different approaches towards the synthetic protocol- solvent based synthesis and hot-injection method in order to obtain phase pure antimony based double perovskite materials. Optical, XRD and electron microscopic characterizations have been undertaken to realize the formation and property of these materials.