**SYNTHESIS AND CHARACTERISATION OF $Sr_2CeO_4$ BLUE EMISSION PHOSPHOR PREPARED THROUGH SOL-GEL PROCESSESS**

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The blue emitting $Sr_2CeO_4$ FED phosphor is receiving the attention of several workers due to low voltage operation for CRT applications and convincing efficiency. It has been prepared either by solid state reaction or combinatorial techniques. However, with a view to preparing a better quality material, a process based on Sol-Gel method is developed. The sol-gel process is one of the alternate routes for the preparation of phosphor materials with better properties like purity, homogeneity and low processing temperature. Thus, the present communication reports the method of preparation of $Sr_2CeO_4$ phosphor by sol-gel method and its characterization by studying X-ray diffraction and Photo luminescence.

The $Sr_2CeO_4$ powder was prepared by dissolving stoichiometric mixture of nitrates of Strontium and cerium in deionised water. To this solution citric acid was added such that the molar ratio of citric acid and metal ions is 1:1. The pH of the resultant metal citrate solution was adjusted to 6-7 by adding dilute ammonia solution drop wise. The solution was slowly evaporated on a water bath till a viscous liquid was obtained. At this stage, gelating reagent ethylene glycol was added such that the mole ratio of citric acid to ethylene glycol was 1:1.2. The mixture was heated on a hot plate/stirrer at 100$^oC$ hours with constant stirring. When this solution starts solidifying and forms a gel like porous mass, the temperature was gradually increased to 160-180$^oC$ till it becomes a solid mass. This porous solid mass thus obtained

was ground in an agate mortar using spectral grade acetone.

The ground solid mass was heated to 400$^oC$ in an electric burner to remove completely the citrates and ethylene glycol that is left over in the solid mass. This precursor is sintered at 1000$^oC$ to get the final product $Sr_2CeO_4$ and this powder material has been used for x-ray diffraction and photo luminescence measurements.

X-ray diffraction pattern of the $Sr_2CeO_4$ powder showed standard peaks confirming the triclinic structure and this pattern coincided with the patterns reported by earlier workers. The particle size has been estimated from x-ray diffractograms using halfwidth method, which is coming about 35nm.

In order to assess its luminescence, the photo luminescence has been recorded at room temperature. The excitation spectrum of $Sr_2Ceo_4$ was obtained in the 280-360nm range and the emission was seen at 452,470,482 and 492nm. The 470nm blue emission is predominating as compared to others. The 470nm emission is sensitive to the firing temperature of the precursor being maximum efficient at 1200$^oC$.

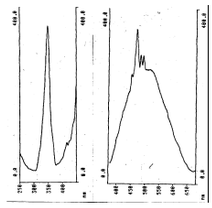

Fig 1.Photo Luminescence of $Sr_2CeO_4$

Fig.1.represents the photo luminescence spectra of $Sr_2Ceo_4$ showing the 470nm emission, excitation is 349nm line. This emission has been attributed to host due to d-f transitions of cerium. These photo luminescent results are comparable with the results reported by earlier workers. The blue white emission band peaking at 482nm is attributed to ligand to metal $Ce^{4+}$ charge transferring.