

# INVESTIGATION OF DIFFERENT FUEL SOURCES USED IN MICROWAVE INDUCED COMBUSTION SYNTHESIS ON THE LUMINESCENCE PROPERTY OF YAG PHOSPHOR

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**ABSTRACT-** White LEDs (WLEDs) have been produced from the combination of blue LED chips and phosphor converter. In the present work, considerable amount of yttrium aluminum garnet (YAG) phosphor powders doped with 0.3 mol % of cerium (Ce) have been synthesized with addition of different fuel sources through Microwave Induced Combustion Synthesis (MICS) method. This method involves the reaction between metal nitrates and two fuel sources, such as urea and glycine. The effects of different fuel sources (urea and urea + glycine) on the crystallinity, structure, luminescent properties and CIE chromaticity were characterized and studied using high resolution X-ray diffraction (HR XRD), field emission-scanning electron microscopy (FE SEM), energy dispersive X-ray spectroscopy (EDX), photoluminescence emission (PL), electroluminescence (EL) and standard CIE 1931 chromaticity diagram. The highest white light emission can be observed for the sample prepared from fuel. It could be noted that the emission intensity could be tuned by controlling the injection current. In contrast, the experimental enhancement in the properties was demonstrated by the WLED synthesized using mixed fuel technique.

**Keywords:** white LEDs, microwave-induced combustion synthesis, mixed fuel technique, white light emission, chromaticity.