

Synthesis of $Y_2O_3:Eu$ nanoparticle phosphor by o/w emulsion-assisted flame spray pyrolysis

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O/W Emulsion-assisted Flame Spray Pyrolysis(O/W EFSP) was developed to synthesis of nanoparticles. Conventional flame spray pyrolysis has difficulty in preparation of multi-component nanoparticles and nanoparticles having desired phase owing to gas-to-particle and high temperature. However, at O/W EFSP, the oil droplet in o/w emulsion function as a detonator in flame, the nanoparticles were synthesized through breaking of water droplet. Not from gas-to-particle but from droplet-to-particle, the nanoparticles were synthesized at relatively low temperature. And, O/W EFSP has very high productivity and economical efficiency.

Eu-doped Y_2O_3 phosphor is well known as a good red phosphor for application in displays such as PDPs, FEDs, projection televisions and FL. At this study, $Y_2O_3:Eu$ nanoparticles phosphor was synthesized by O/W EFSP. The crystal structure and the morphology of $Y_2O_3:Eu$ nanoparticles synthesized by O/W EFSP were investigated by XRD and SEM. Photoluminescence measurements were performed with a spectrophotometer using a Xe lamp excitation source.