

Lanthanide Incorporated Dendron Based White Light Emitting Material

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Abstract : The White light emitting material has an emerging field in recent years due to their widespread application in the field of optoelectronics and cellular display. In the present study, we have achieved white light emission in gel medium through partial resonance energy transfer from different donors (naphthalene, phenanthrene, and pyrene) to lanthanides {Eu(III) and Tb(III)}. The gel was formed by the self-assembly of glucose cored poly(aryl ether) dendrons in DMSO-Water mixture (1:9 v/v). The white light emission was further confirmed by the CIE coordinates (Commission Internationale d' Eclairage). Moreover, we have developed three different white light emitting system by utilizing three different donor moiety namely, naphthalene-Tb(III)-Eu(III) {I}, phenanthrene-Tb(III)-Eu(III) {II}, and pyrene-Tb(III)-Eu(III) {III}. The CIE coordinates for I, II and III were (0.35, 0.37), (0.33, 0.32) and (0.35, 0.33) respectively. Furthermore, we have investigated the energy transfer from different donors (phenanthrene, naphthalene, and pyrene) to lanthanide {Eu(III)}. The efficiency of energy transfer from phenanthrene-Eu(III), naphthalene-Eu(III) and pyrene-Eu(III) systems was 11.9%, 3.9%, and 3.6%, respectively. Detailed mechanistic aspects will be displayed in the poster.

Keywords : dendron, lanthanide, resonance energy transfer, white light emission

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