Fluorescence Observation of Spatiotemporal Heterogeneity of Aggregation Structure in Thin Film by Difluoroboron β-Diketonate Dyes

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For the development of next-generation flexible OLED devices, the drop-casting method has been attracting attention as a technology for forming thin films easily and at a low cost. Therefore, investigating the aggregation dynamics of the formation of films during the drop-casting process is important for the development of fundamental understanding in this field. In this study, Hyperspectral camera (HSC) fluorescence imaging was newly applied to evaluate spatiotemporal heterogeneity in the thin film, collecting the fluorescence spectra from each region of the sample. Figure 1 shows the spatial-resolved fluorescence spectra of difluoroboron β-diketonate dyes (BF_2DBMb) casting from the solution.[1][2] As future work, we expand the system to CPL to observe molecular conformation and orientation in the thin film. We are now working on synthesizing new types of β-diketonate compounds which exhibit different circularly-polarized luminescence properties (CPL) depending on the aggregation structure [3].

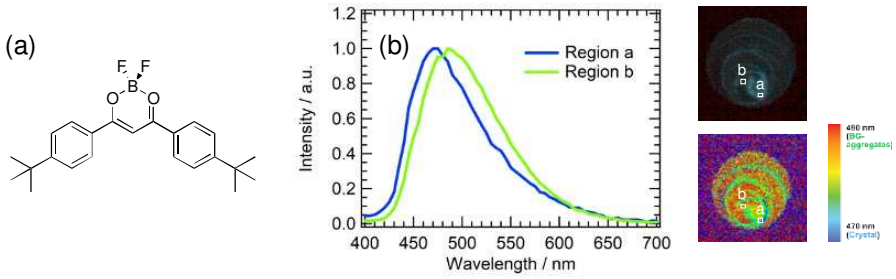

Figure 1. (a) Molecular structure of BF_2DBMb, (b) Fluorescence spectra, fluorescence image and spectral color mapping of a drop-casted film after evaporation obtained by HSC.

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