

Synthesis and Mechanochromic Luminescence of Boron β -Dialdiminate Complexes with Alkyl Ether Chain

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Solid-state emissive materials have been widely investigated for improving the performance of various devices such as light-emitting diodes and chemosensors. We have recently reported that boron β -dialdiminate complexes are emissive efficiently in both solution and solid states. Herein, we will report syntheses of boron β -dialdiminate complexes modified by alkyl-ether groups and their photophysical properties in solution and solid.

We prepared three complexes, **DAIBF-OC1**, **DAIBF-OC12** and **DAIBF-OC18**, which are modified by different linear alkyl-ether chains as shown in Figure 1. All compounds exhibited almost the same photophysical properties in solution, while they showed different solid-state emission behaviors. Photoluminescence spectra of the solids of **DAIBF-OC12** and **DAIBF-OC18** were observed in the higher energy regions than that of **DAIBF-OC1** (Table 1). Moreover, when these two complexes with long alkyl chains were ground mechanically, their emissions showed bathochromic shifts (Figure 2, Table 1). It is assumed that the mechanical stimuli should lead to phase transitions accompanied by the chromic luminescence. The C1 congener, on the other hand, showed no significant change resulted from the mechanical stimuli. In our presentation, we will discuss the origin of these unique behaviors in detail.

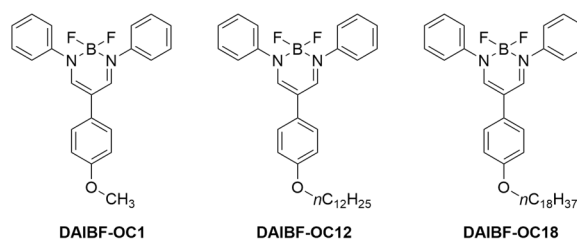


Figure 1. Chemical structures of **DAIBF-OC1**, **DAIBF-OC12**, and **DAIBF-OC18**.

Table 1. Photophysical properties of **DAIBF-OC1** and **DAIBF-OC18**

DAIBF-OC1	$\lambda_{\text{abs}} / \text{nm}$	$\lambda_{\text{em}} / \text{nm}$	Φ_{PL}
Solution (CHCl_3)	406	518	0.71
Solid	-	523	0.59

DAIBF-OC12	$\lambda_{\text{abs}} / \text{nm}$	$\lambda_{\text{em}} / \text{nm}$	Φ_{PL}
Solution (CHCl_3)	407	514	0.69
Solid	-	493	0.46
Ground	-	511	0.39

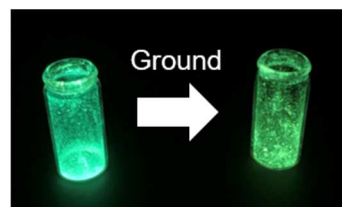


Figure 2. Photographs of **DAIBF-OC12** before and after grinding.