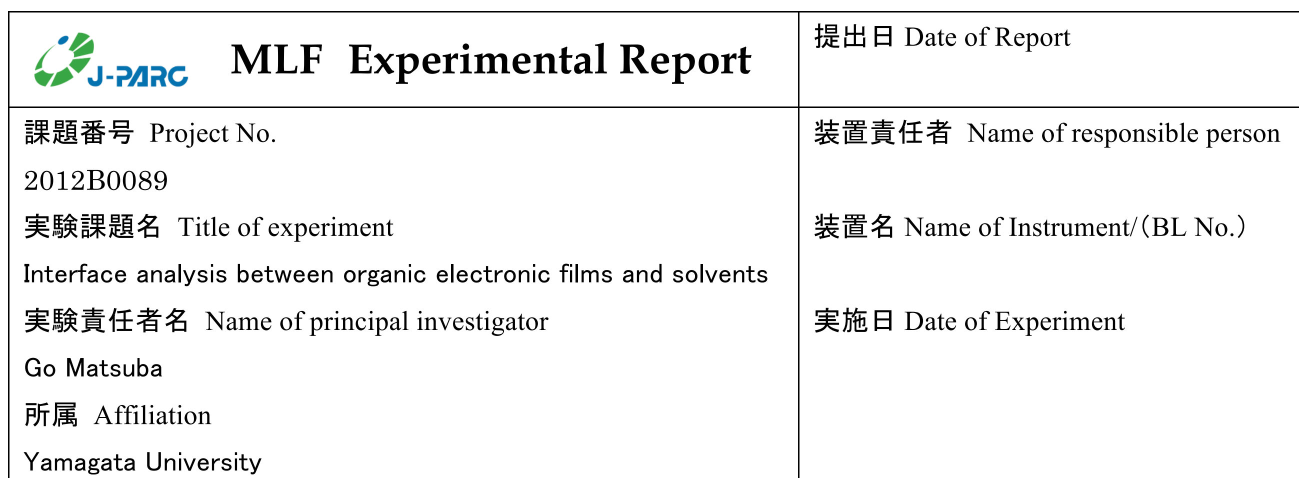
（※本報告書は英語で記述してください。ただし、産業利用課題として採択されている方は日本語で記述していただいても結構です。）



J-PARC MLF Experimental Report	提出日 Date of Report
課題番号 Project No. 2012B0089 実験課題名 Title of experiment Interface analysis between organic electronic films and solvents 実験責任者名 Name of principal investigator Go Matsuba 所属 Affiliation Yamagata University	装置責任者 Name of responsible person 装置名 Name of Instrument/(BL No.) 実施日 Date of Experiment

試料、実験方法、利用の結果得られた主なデータ、考察、結論等を、記述して下さい。（適宜、図表添付のこと）

Please report your samples, experimental method and results, discussion and conclusions. Please add figures and tables for better explanation.

1. 試料 Name of sample(s) and chemical formula, or compositions including physical form.

TFB thin film (Figure 1) in the evaporation condition and various applied conditions. For the EML (light emission layer), we used several protonated and deuterated chemicals in Figure 2. These films are used for Organic light emitting diode(OLED).

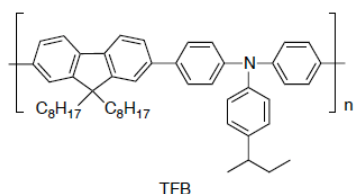


Figure 1 Molecular structure of TFB

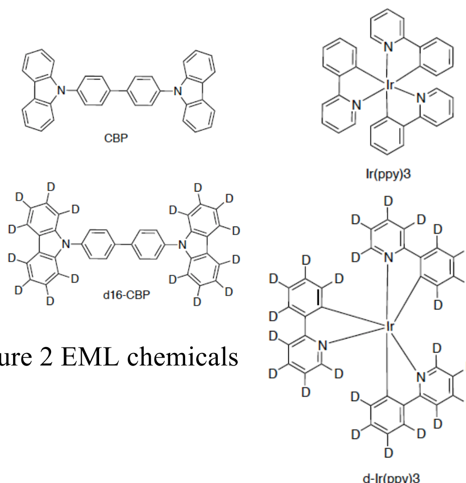


Figure 2 EML chemicals

2. 実験方法及び結果（実験がうまくいかなかった場合、その理由を記述してください。）

Experimental method and results. If you failed to conduct experiment as planned, please describe reasons.

Experimentals

We carried out the neutron reflectivity measurements with SOFIA spectrometer in J-PARC. The condition is at room temperature and under ordinary pressure. All the samples were on 3-inch silicon plate prepared at Yamagata University in advance.

2. 実験方法及び結果（つづき） Experimental method and results (continued)

Results

Figure 3 shows the neutron reflectivity profiles in evaporated thin film and applied film with dioxane and cyclopentanone. In the evapolated film, the strong fringes could be observed, while the weak fringes in the applied thin films. This suggests that the roughness between the interface between TFB and EML is strong dependent on the making process of the thin films.

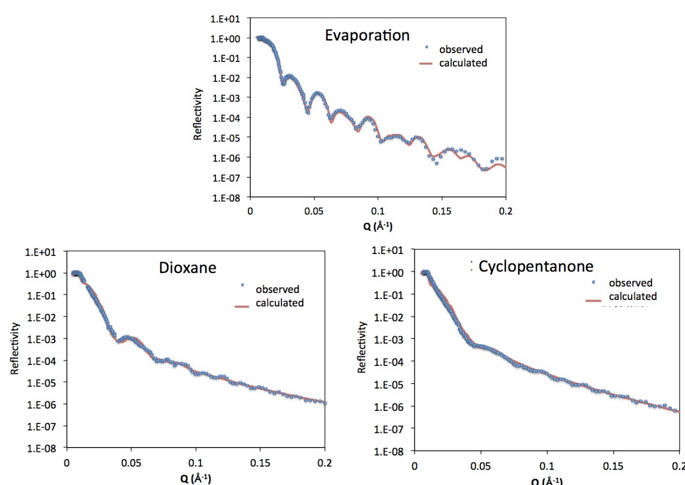


Figure 3 Neutron reflectivity profiles of OLED thin films in various preparing processes.

Figure 4 shows the scattering length density profiles used to calculate the reflectivity in the evaporated and applied thin films. The thickness of interface is strongly dependent on the preparing processes. In evaporation, the interfacial thickness is quite small (24 A), but we could observe low scattering length density layer. In application, the interfacial thickness depends on correlation between TFB and solvents.

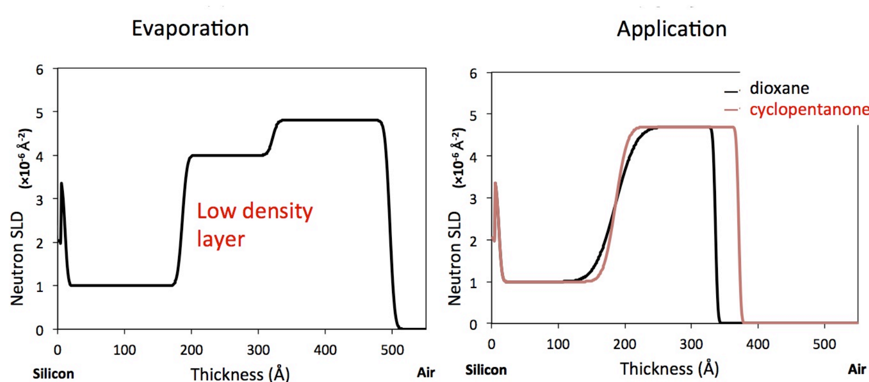


Figure 4 The SLD dependence of thickness. The zero-point is the silicon surface.