

**Supplementary Information**

**of**

**Nucleation, absorption, or desorption of metal-vapor atoms on  
amorphous photochromic diarylethene films having a low glass  
transition temperature**

Tsuyoshi Tsujioka\* and Saki Matsumoto

Department of Arts and Sciences, Osaka Kyoiku University,

4-698-2, Asahigaoka, Kashiwara, Osaka 582-8582, Japan

\*E-mail: [tsujioka@cc.osaka-kyoiku.ac.jp](mailto:tsujioka@cc.osaka-kyoiku.ac.jp)

To investigate the chemical reaction between metal and DAE molecules, DAE monolayer (for the reference) and DAE-metal multilayer samples were prepared and absorption spectra of these samples were compared. The multilayer sample was consisting of 10 layers of metal and 11 layers of DAE, and therefore was having 20 interfaces. The total thickness of DAE was set to be the same between monolayer and the multilayer samples. Each layer was fabricated by a conventional vacuum evaporation method (back pressure:  $1 \times 10^{-3}$  Pa).

As mentioned in the main text, the spectra of DAE-Ca multilayer was dramatically changed (reduced  $\Delta Abs$  and deformed spectrum) and this attributed to the chemical reaction between Ca and DAE molecules. On the other hand, no significant difference were observed in absorption spectra for the DAE-In, DAE-Ag, and DAE-Pb multilayer samples (Figs. S1, S2 and S3). These results mean no chemical reaction between such

metals and DAE molecules.

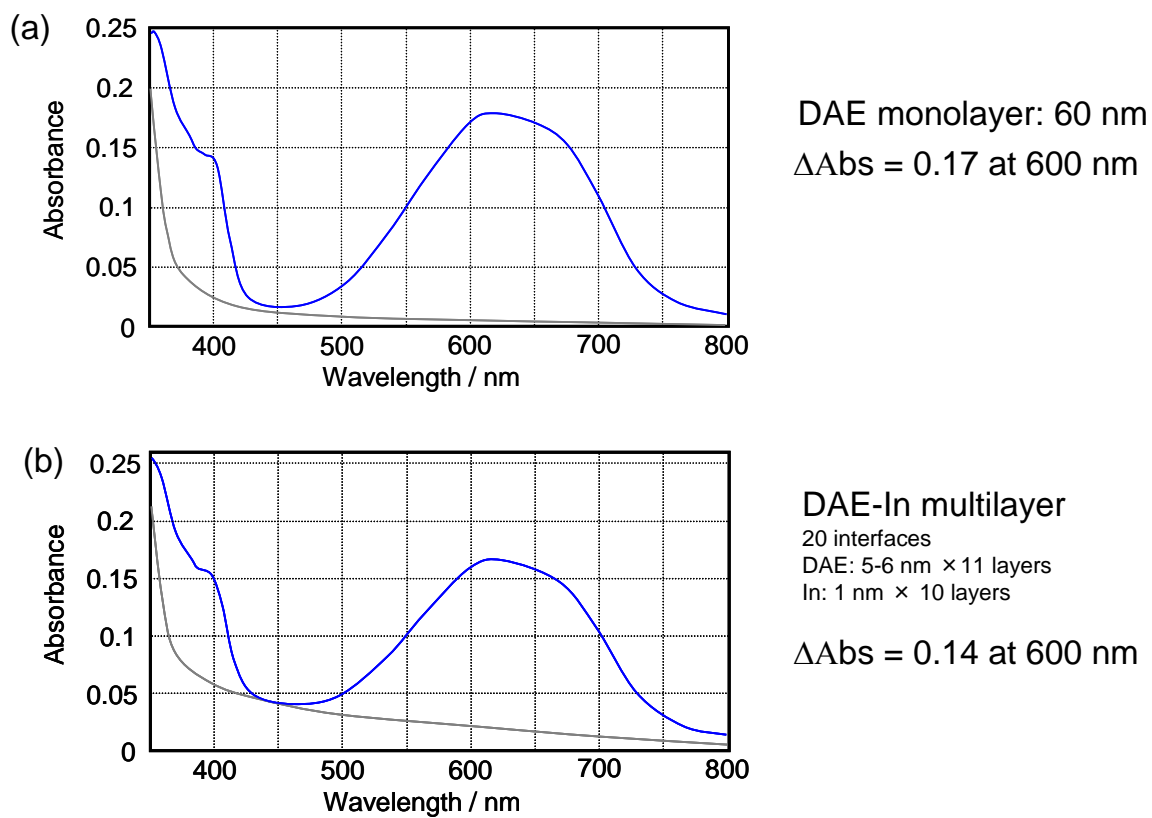


Fig. S1 Absorption spectra of (a) DAE monolayer and (b) DAE-In multilayer.

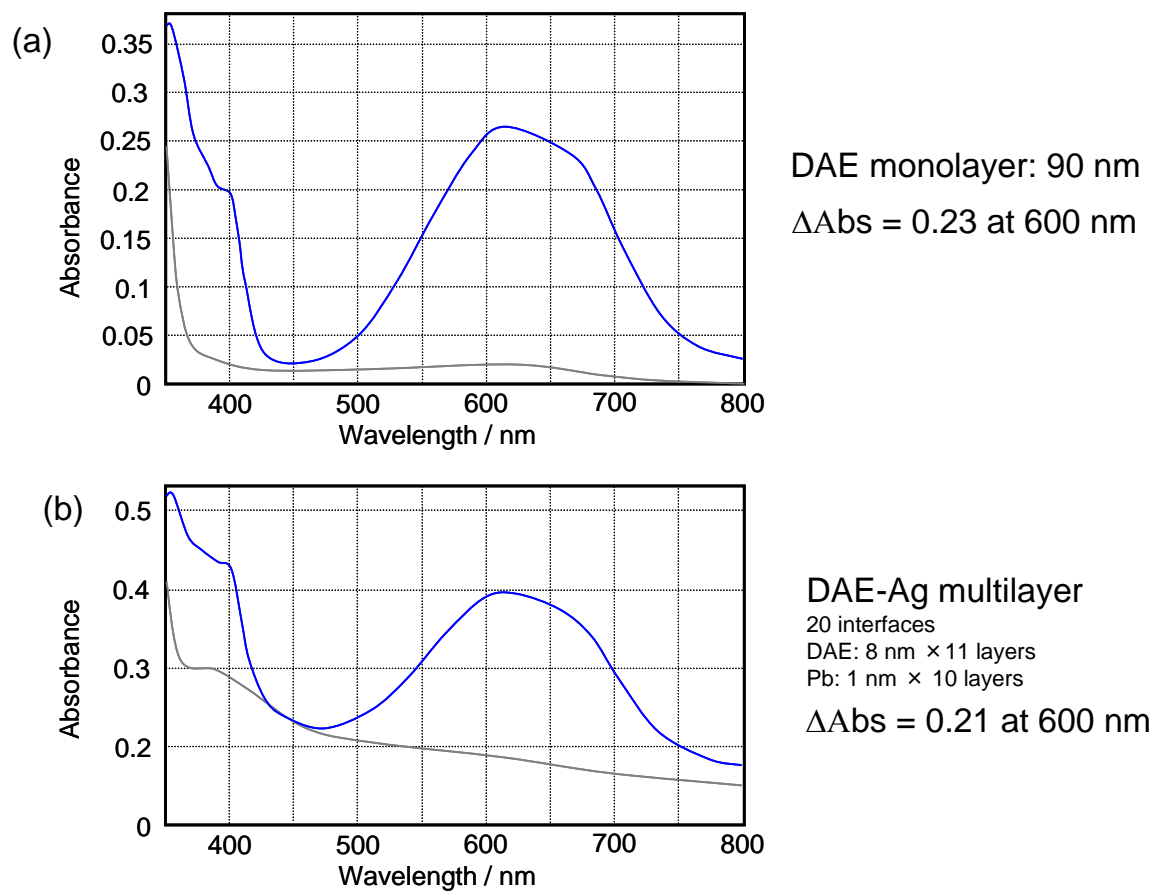


Fig. S2 Absorption spectra of (a) DAE monolayer and (b) DAE-Ag multilayer.

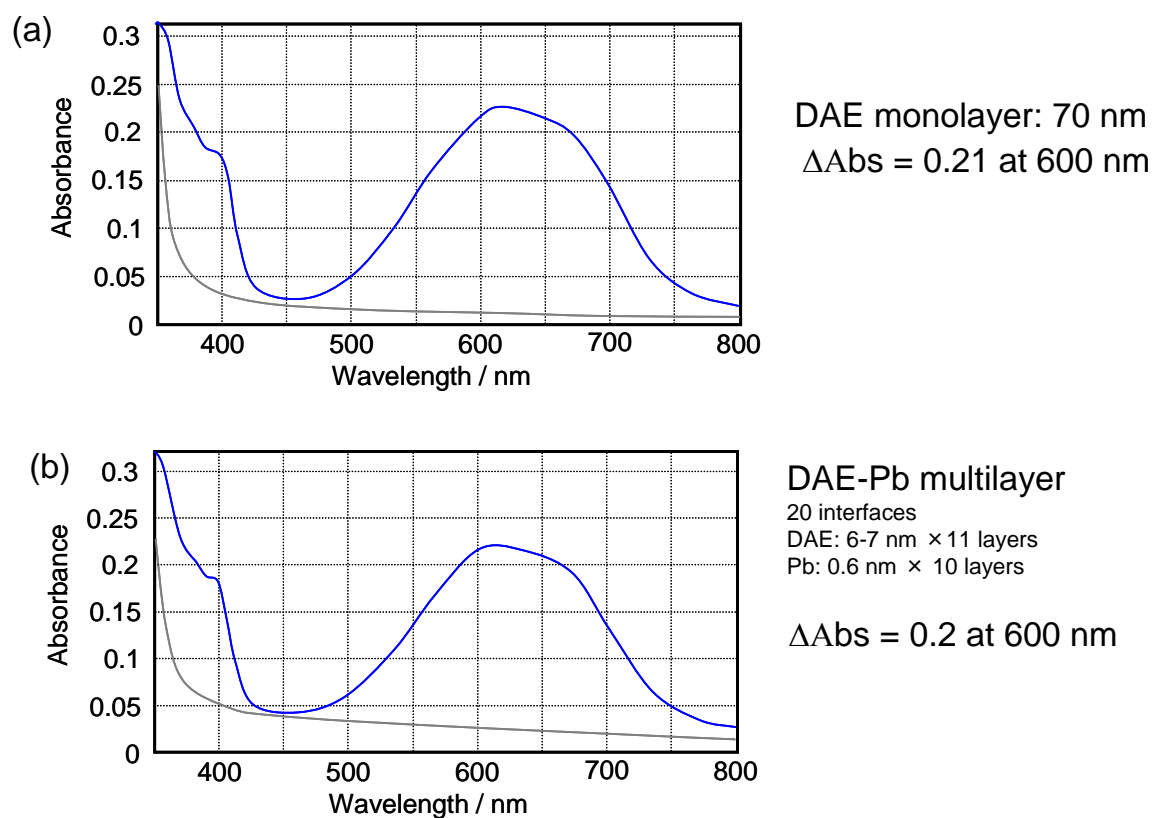


Fig. S3 Absorption spectra of (a) DAE monolayer and (b) DAE-Pb multilayer.