

Probing the photo induced phase transition in $(\text{C}_2\text{H}_5)_2(\text{CH}_3)_2\text{Sb}[\text{Pd}(\text{dmit})_2]_2$ II

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$(\text{C}_2\text{H}_5)_2(\text{CH}_3)_2\text{Sb}[\text{Pd}(\text{dmit})_2]_2$ shows a valence transition, the so-called “charge separation (CS)”. We have found sensitive and fast photo-induced reflectivity change in the CS phase triggered by an intra-dimer transition as reported in the previous presentation¹. This photo-induced spectral change can be classified as a photo-induced phase transition, judging from the conversion efficiency and the co-operativity. In order to investigate this photo-induced phenomenon more precisely, we have measured the temperature dependence of the pump-probe time-resolved spectroscopy.

Figure 1 shows the temperature dependence of the relaxation time which can be deduced from the time profile of the pump-probe signal by the fitting procedure assuming exponential decay. The relaxation time seems to increase as the transition temperature (about 70 K) is approached. This temperature dependence, the so-called critical slowing down, implies the importance of the co-operative interaction in the photo-induced phase transition in this material.

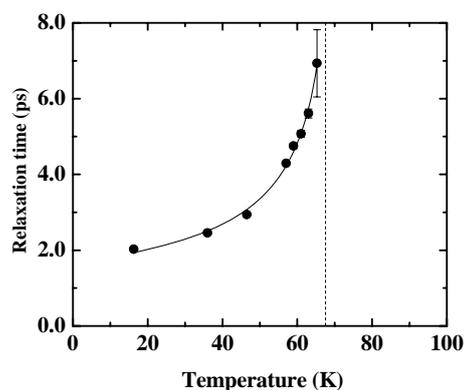


Fig. 1. Temperature dependence of the relaxation time of the photo-induced reflectivity change. Solid line is a guide to eyes. Dashed line indicates the transition temperature determined by the change of reflectivity.

References

- [1] N. Fukazawa *et al.*, presentation in this conference.