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Abstract

Bilayer films consisting of poly{[2-methoxy-5-(2-ethylhexyloxy)-1,4-phenylene]vinylene} (MEH-PPV) and 5-(4-Carboxyphenyl)-10,15,20-triphenyl-21*H*,23*H*-porphine (H_2TPP(COOH)) layers are fabricated by spin-coating method. Excitation energy transfer from MEH-PPV to H_2TPP(COOH) is studied via steady-state optical measurements. To clarify the energy transfer mechanism, the dependence of the energy transfer efficiency on the distance between an energy donor and acceptor is investigated by inserting a magnesium fluoride (MgF_2) layer as a spacer. In the films of MEH-PPV/MgF_2/H_2TPP(COOH), the excitation energy transfer occurs when the spacer layer thickness is less than 8 nm. On the other hand, the energy transfer is not observed in the MEH-PPV/MgF_2/H_2TPP(COOH) film with the MgF_2 layer thickness of 15 nm. These results indicate that Förster-type mechanism is responsible for the energy transfer in the thin films of MEH-PPV/H_2TPP(COOH). In addition, the blend film of MEH-PPV:H_2TPP(COOH) exhibits a well-amplified fluorescence based on the energy transfer owing to sufficiently