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Tunable light-emitting carbon-dot/polymer flexible films prepared through one-pot synthesis

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Development of efficient, inexpensive and environmental-friendly light emitters, particularly devices that produce white light have drawn intense interest due to diverse applications in the lighting industry, photonics, solar energy and others. We present a simple strategy for the fabrication of flexible transparent films exhibiting tunable light emission through one-pot synthesis of polymer matrices with embedded carbon dots assembled in situ. Importantly, different luminescence colors were produced simply by preparing C-dot/polymer films using carbon precursors that yielded C-dots exhibiting distinct fluorescence emission profiles. Furthermore, mixtures of C-dot precursors could also be employed for fabricating films exhibiting different colors. In particular, we successfully produced films emitting white light with attractive properties (i.e., warm white light with a high color rendering index)—a highly sought after goal in optical technologies.

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