

Organic glow-in-the-dark and energy storage polymers

Summary

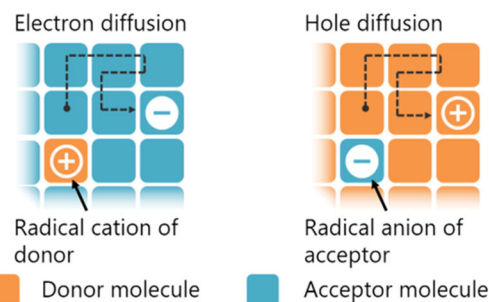
Most light-storage materials, such as glow-in-the-dark polymers and inks, use inorganic materials containing rare-earth metals. These materials are not environmentally friendly, can be difficult to process for certain applications, and have a limited excitation band.

A team of researchers led by Prof. Ryota Kabe has developed a series of metal-free polymeric materials that contain donor, acceptor and trap/emitter compounds. The active components can be covalently incorporated within the polymer chains or stably blended within the polymer. This novel class of materials offers an environmentally friendly solution for many applications including glow-in-the-dark materials, bioimaging and optical data storage.

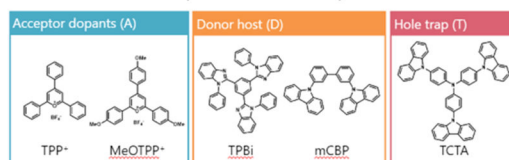
Technology

The technology is based on single- or multi-component organic long-persistent luminescence (OLPL) polymers containing a p-type (hole diffusion) system that exhibits a persistent luminescence in air and ease of processability. In the single-component materials, the polymer chain is covalently bound to both the electron acceptor and donor molecules.

The material composition can be tuned to selectively store specific wavelength ranges, which can be stored and released quantitatively upon application of a stimulus (e.g. thermal, electrical, mechanical).



Acceptor : Donor : Hole trap = 1 : 99 : 1



Applications

- Glow-in-the-dark paints and inks
- Optical data storage
- X-ray dosimetry
- Bioimaging

Advantages

- Metal-free
- Soluble and easy to process
- Stable blend: no aggregation or phase separation of components

Category

Chemistry & Materials Science

Lead Researcher

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Intellectual Property

Patent Pending

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