

## Development of air-stable organic glow-in-the-dark materials

Ryota Kabe

Sri Lakshmi Venkata Narayana Yemineni  
Organic Optoelectronics Unit

### What is the problem?

The glow-in-the-dark market will see continued growth in the coming years owing to its increasing applications in various signage boards, consumer goods and bio-imaging. The glow-in-the-dark market is predicted to grow at a CAGR of 4.5% up to 2025. However, inorganic materials are mainly used as glow-in-the-dark materials for the above applications. These inorganic materials are not environmentally friendly, difficult to process for certain applications, and have a limited excitation band.

### What is your solution?

We have been developing novel glow-in-the-dark materials made by organic molecules. Organic long persistent luminescence (OLPL) material is transparent and soluble and can be readily processed into flexible thin films. The luminescence color can be adjusted through the addition of organic dopants. The robust and flexible composition of this material can reduce the cost and environmental impact of existing glow-in-the-dark products, as well as open up new applications e.g. as flexible films/paints for large areas and as biomarkers.



Figure 1. Flexible and transparent glow-in-the-dark film made by organic molecules.

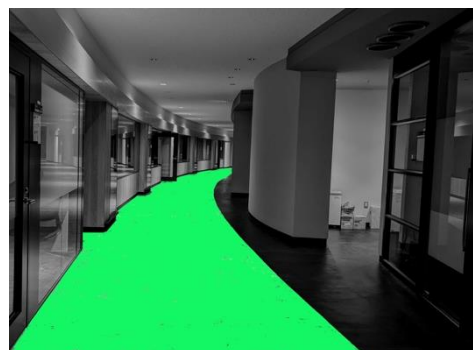


Figure 2. Glow-in-the-dark paints

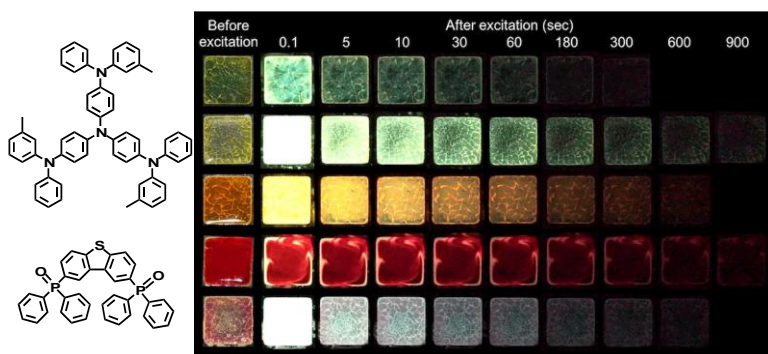


Figure 3. Chemical structures of organic glow-in-the-dark system and emission color adjustment from blue to red.

**Keywords:** Glow-in-the-dark, Persistent Luminescence, Stimulated Luminescence

### Other resources

- [Unit publication list](#)
- [Description of the technology](#)
- [Unit website](#)

### Contribution to SDGs



For more information:

tds@oist.jp