

27 December 2024

Translated from Japanese

Development of perovskite that reversibly changes colour with temperature



On November 22, 2024, Nanyang Technological University in Singapore announced that its research team has developed a perovskite that can reversibly change colour with temperature.

Perovskites are layered organic/inorganic semiconductor materials that can be fabricated by solution-processing techniques and are used in devices such as solar cells and light-emitting diodes. In this study, perovskites were synthesised by incorporating dimethyl carbonate, a harmless solvent, between the layers of methylammonium-based perovskite.

The research team synthesised four materials with different ratios of methylammonium (MA) and dimethyl carbonate (DMC) in the perovskite and found that the electronic state can be adjusted by changing the ratio, and that the DMC molecule acts as a spacer between layers to show a unique perovskite structure.

Moreover, one of the perovskites exhibited a reversible colour change, changing from orange to red when heated to 80 °C and reverting to the original colour when cooled to room temperature for 25 cycles.

Perovskites, which can reversibly change colour depending on temperature, are expected to be used in various applications such as smart coatings and heat-sensitive inks. The results of this research were published in the *Journal of the American Chemical Society* on February 29, 2024.

https://engineer.fabcross.jp/archive/241227_designing-colour-changing-semiconductor-materials.html