

High-Performance Electrochromic Devices (Yeda)

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Summary

High performance electrochromic materials that exhibit a practical combination of low-voltage operation and efficient color switching as well as long-term stability have been developed by the group of Prof. van der Boom. Electrochromic materials undergo reversible optical changes in response to external applied voltage, which results in a reversible color change. This property enables electrochromic materials to be used for a wide range of applications, including smart glass, electrochromic mirrors, color displays, electrochromic paper, electrochromic goggles and motorcycle helmet-visors. The presented technology utilizes electrochromic coordination complexes and offers an easy and cost-effective coating process, diverse color palette, intense coloration, short switching time and long term stability.

Applications

- Smart windows/smart glass
- Color displays and electrochromic paper
- Smart mirrors
- Electrochromic lenses, goggles and helmet-visors
- Wearables

Advantages

- Fully reversible optical responses
- Very high coloration efficiency
- Color tuning via molecular design
- 95% switching)
- High switching efficiency (efficient switching at 100 ms) and stability
- Uniform coating technique, applicable for large scale surfaces

Technology's Essence

The invention includes the design, synthesis, and electrochemical switching of optical properties of molecular coatings for electrochromic devices. Fully reversible optical responses occur with variation of the oxidation state of metal organic complexes. The low-voltage operation of