# Photocatalytic Color Switching Of Redox Imaging Nanomaterials For Rewritable Media

Tech ID: 24555 / UC Case 2015-250-0

## PATENT STATUS

| Country | Type | Number | Dated | Case |
|---|---|---|---|---|
| United States Of America | Issued Patent | 10,534,254 | 01/14/2020 | 2015-250 |

## FULL DESCRIPTION

### Background

Paper and ink cartridges increase business costs and also create huge environmental problems including deforestation, solid waste and chemical pollution to air, water and land. Rewritable paper is an attractive alternative that can have enormous economic and environmental merits. However, progress has been limited in this area because of a few major challenges:

- Color switching often becomes much slower.
- Many switchable dyes retain their color for only few hours under ambient conditions.
- Toxicity of switchable dyes is an issue for daily use.
- Switchable dyes involve complex synthesis are therefore expensive.

### Current Invention

Prof. Yadong Yin and his research team at UCR have fabricated a novel, patented solid composite film in which letters and patterns can be repeatedly printed using UV light, retained for days and then erased by simple heating. The imaging layer of the rewritable film is composed of Titanium dioxide (TiO2) nanocrystals, a redox dye and hydroxyethyl cellulose – materials widely used in cosmetics and household products.

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## OTHER INFORMATION

### KEYWORDS

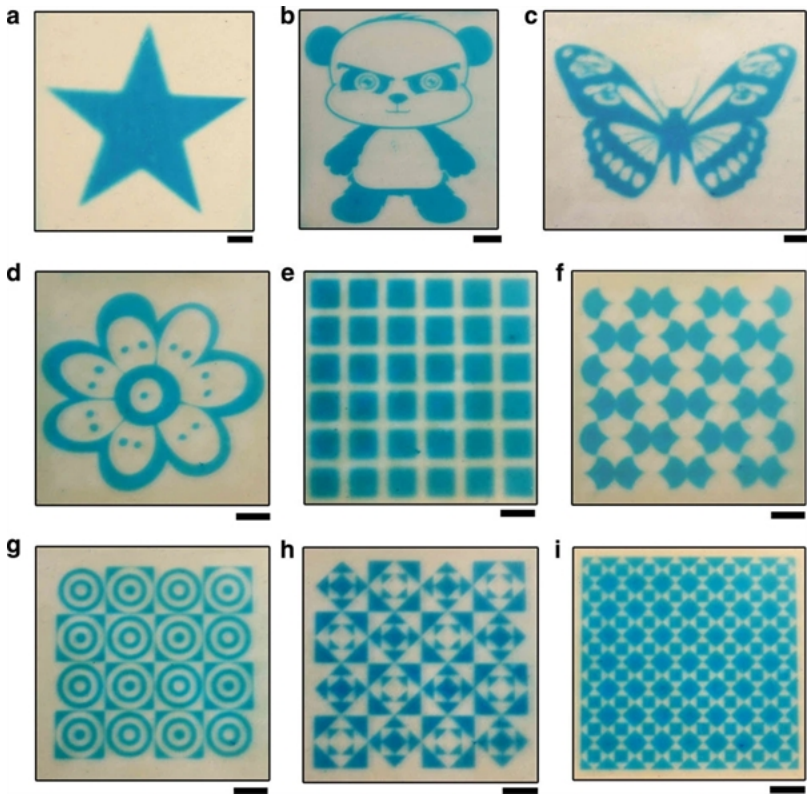
light-responsive material, nanomaterial, nanotechnology, rewriteable material, sensing devices, energy concentration

### CATEGORIZED AS

- Environment
  - Other
- Materials & Chemicals
  - Other

### RELATED CASES

2015-250-0




Example of printing complex patterns on the rewritable paper.

## ADVANTAGES

The significant aspects and advantages of this invention are:

- The rewritable paper can be erased and rewritten > 20 times with no significant loss in resolution.
- Letters and various complicated patterns can be printed on the rewritable paper with excellent resolution.
- The process involves low cost, low toxicity, and low energy consumption.
- The design principle can be extended to various commercial redox dyes to produce rewritable paper capable of showing prints of different colors. In addition to glass substrates the composite film can also be deposited on plastic substrates for producing flexible rewritable paper.
- Printed letters remain legible for > 3 days – sufficient for many practical applications such as newspapers.

## APPLICATIONS

- Rewriteable media
- Dynamic display and signage technologies
- Sensing devices

## RELATED MATERIALS

- Photocatalytic colour switching of redox dyes for ink-free light-printable rewritable paper

## INVENTION BY PROF. YADONG YIN

Please review all inventions by Prof. Yadong Yin and his team at UCR

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