

Enhancing Light-Matter Interactions In Mos2 By Copper Intercalation

Tech ID: 33397 / UC Case 2021-891-0

ABSTRACT

Researchers at the University of California, Davis have developed layered 2D MoS2 nanostructures that have their light-interactive properties improved by intercalation with transition and post-transition metal atoms, specifically Copper and Tin.

FULL DESCRIPTION

The technology involves photodetectors made of 2-dimensional vertically-aligned MoS2 layers. The van der Waals gap in at least two layers of MoS2 is intercalated with metal atoms such as Copper and Tin to enhance light-matter interactions. These intercalated atoms introduce electronic states near the MoS2's conduction band, boosting the photodetector's efficiency, especially in the near-infrared spectrum.

APPLICATIONS

- ▶ Optical sensors such as photodetectors
- ▶ Night-vision image intensifiers
- ▶ Technologies operating in low-light conditions or high vegetation terrain.

FEATURES/BENEFITS

- ▶ Enhanced light-matter interactions in near-infrared spectrum
- ▶ Improved photodetector efficiency
- ▶ Increased photoresponsivity and absorption capabilities in the infrared range.
- ▶ Addresses weak absorption in IR spectral region of 2D MoS2 devices
- ▶ Solves inefficient light-interactive properties of 2D MoS2 structures.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	12,037,259	07/16/2024	2021-891

Additional Patents Pending

CONTACT

Victor Haroldsen
haroldsen@ucdavis.edu
tel: 530-752-7717.



INVENTORS

- ▶ Koski, Kristie

OTHER INFORMATION

KEYWORDS

MoS2, nanostructures,
near-infrared spectrum,
light-interactivity, light-matter interaction,
photodetector,
photoresponsivity, optical sensors

CATEGORIZED AS

- ▶ **Optics and Photonics**
 - ▶ All Optics and Photonics
- ▶ **Engineering**
 - ▶ Engineering
 - ▶ Other
- ▶ **Materials & Chemicals**
 - ▶ Nanomaterials
 - ▶ Other

- ▶ **Nanotechnology**
- ▶ Materials
- ▶ Other
- ▶ Tools and Devices

RELATED CASES

2021-891-0

University of California, Davis
Technology Transfer Office

1 Shields Avenue, Mrak Hall 4th Floor,
Davis,CA 95616

Tel: © 2024, The Regents of the University of California
530.754.8649 [Terms of use](#)
techtransfer@ucdavis.edu [Privacy Notice](#)
[https://research.ucdavis.edu/technology-](https://research.ucdavis.edu/technology-transfer/)
[transfer/](https://research.ucdavis.edu/technology-transfer/)
Fax:
530.754.7620