

ADMD 2020

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先端ディスプレイ材料とデバイスに関する国際シンポジウム

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Chuo University, Korakuen, Tokyo, Japan

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中央大学, 文京区後楽園キャンパス

Special Lecture

特別講演会 (一般公開)



Professor Hideo Hosono Tokyo Institute of Technology

(東京工業大学 細野秀雄 教授)

“Amorphous Oxide Semiconductors for TFTs, OLEDs, and Perovskite-LEDs”

Date: October 17

Time: 9:10-10:10 (tentative)

Place: Bldg.5, Rm. 5333

講演は英語で行われます。同時通訳はありません。

In 1995, we presented a material design concept for transparent amorphous oxide semiconductors (TAOS) with large electron mobility at 16th International Conference on Amorphous Semiconductors . This concept was based a simple consideration on chemical bonding of oxides. The first paper on IGZO-TFTs was reported in 2003 on the crystalline channel layer and in 2004 on the amorphous. The commercialization of high resolution and energy saving LCD panels with IGZO-TFT backplane started in 2012. The most visible product with IGZO-backplane would be large-sized OLED-TVs. Such situation was almost beyond imagination 20 years ago .

In this talk, we would like to show 3 new transparent amorphous semiconductors which were developed for OLEDs/QLEDs along with materials design concepts. First is amorphous electride C12A7: e with very small work function and chemical stability . Second is X-ray amorphous ZnO-SiO₂ thin films with small work function and easy Ohmic contact formation with various metals and semiconductors . Such a feature makes it possible to fabricate tandem-type OLED devices without significant voltage drop . The last is amorphous transparent p-type semiconductor, Cu-Sn-I with large mobility (~10cm²/Vs) which can be fabricated by spin-coating at low temperature. Recently, we realized very high green and red light emission from perovskite LEDs by applying an appropriate TAOS as the electron injection layer.

Honor and Prizes:

James C. McGroddy Prize, Arthur von Hippel Prize

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