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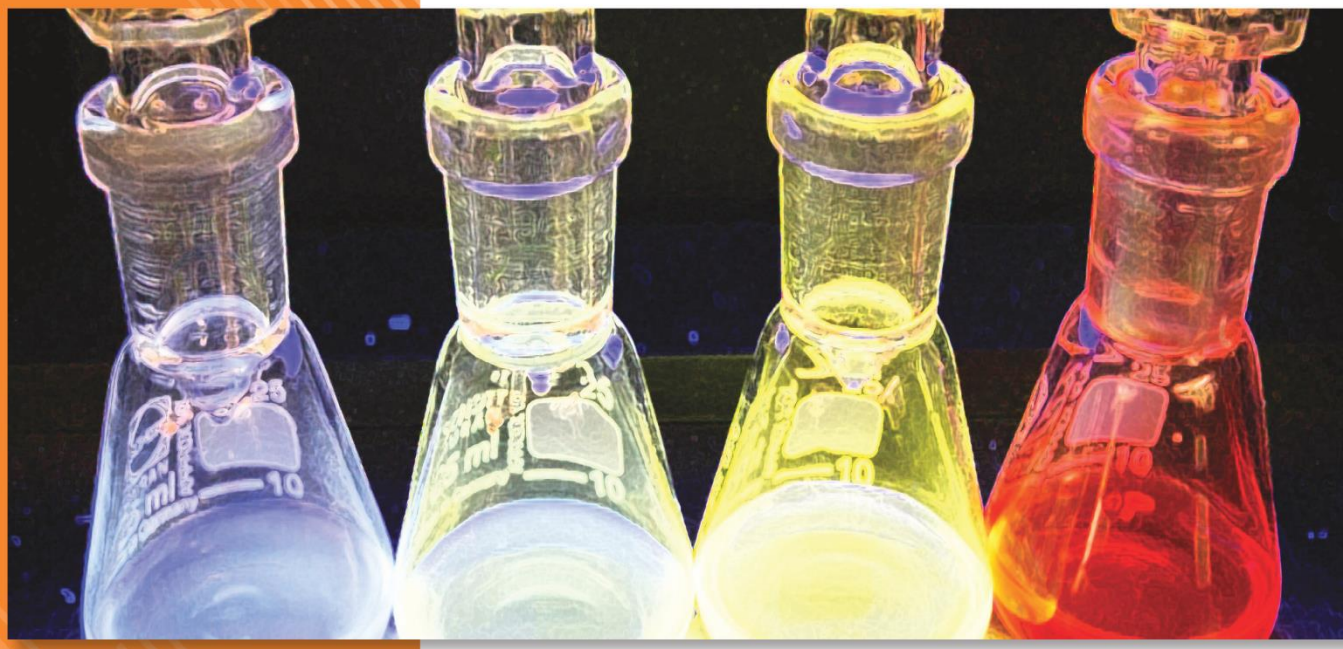

Crystalline MoOx hole transport layers for organic photovoltaic devices

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Molybdenum-oxide (MoO_x) thin films have attracted a lot of attention in the past years due to their unique ability to act as interfacial layers in electronics and energy applications. In the work presented here, large tuning possibilities in the optoelectronic properties of MoO_x thin films deposited by reactive sputtering are demonstrated, along with the implementation of the films in organic photovoltaic devices. The possibility of tuning the optical and electrical properties of the films arises by controlling the oxygen partial pressure during the growth process[1]. Ultraviolet (UPS) and X-Ray (XPS) Photoelectron Spectroscopy investigations are conducted for accessing information about the work function and surface composition of the thin-films, whereas TEM investigations are conducted to achieve information about the crystal structure. Importantly, the work function of the films increase strongly upon vacuum annealing, and span a tuning range of almost 2 eV[2]. Application of the crystalline MoOx thin films in novel organic optoelectronic devices is demonstrated by employing them as hole transport layers in DBP:C70 based small molecule solar cells, where they show promising characteristics.

[1]A. L. F. Cauduro, *et al*., Appl. Phys. Lett. 106, 202101 (2015)
[2]A. L. F. Cauduro, *et al*., ACS Appl. Mater. Interfaces, **9**, 7717 (2017)