

## UV/Thermally Induced Isomerization of Spiropyran on MoS<sub>2</sub> Lattice

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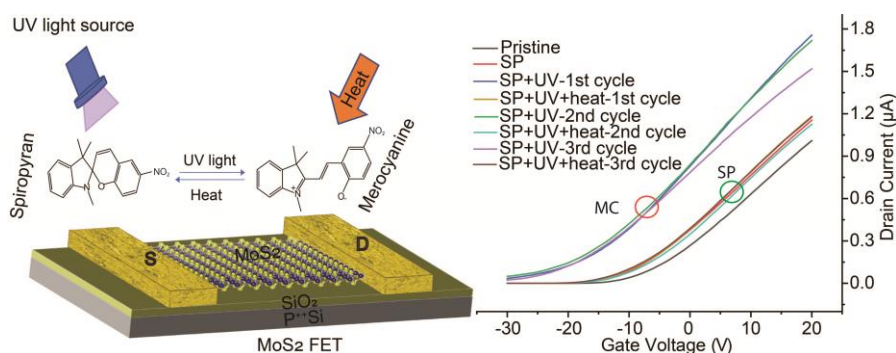
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**Abstract:** Nanotechnology is being considered as a mainstream technology of the 21<sup>st</sup> century due to its aspects of observing and modifying matter at the nano level.<sup>1</sup> Molecules with very specific functional groups can be modulated by outside stimuli are of great interest for sensing and optoelectronics.<sup>2</sup> In this report, we observe the photo/thermal induced structural switching of spiropyran (1',3'-Dihydro-1',3',3'-trimethyl-6-nitrospiro[2H-1-benzopyran-2,2'-(2H)-indole]) molecule through electrical property measurement by MoS<sub>2</sub>-FET (Fig 1a shows the illustration of molecular switching on MoS<sub>2</sub>-FET). Well controlled functionalization of MoS<sub>2</sub> by spiropyran (SP) can be possible by the external photon irradiation. The conformational change of the spiropyran between spiropyran and merocyanine (MC) was monitored, shown I Fig 1b. TOF-SIMS measurement confirms the presence of spiropyran over the MoS<sub>2</sub> after functionalization. Raman spectroscopy confirms the n-doping of both SP and MC.



**Fig. 1** (a) Illustration of SP/MC isomerization on MoS<sub>2</sub>-FET, (b)  $I_d$ - $V_g$  cycles induced by UV/thermal heat.

### References

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- [2] C.-a. Di, F. Zhang and D. Zhu, *Adv. Mater.*, 2013, **25**, 313-330.