

The healing effect of thiol-bearing molecules on CVD grown MoS₂

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Abstract

Vacancies in atomically thin molybdenum disulfide (MoS₂) play an important role in controlling its optical and electronic properties, which are crucial for applications such as gas sensors, catalysts and electronics¹. For this reason, defect engineering employing thiol-terminated molecules is used to either heal or functionalize the defective nanosheets^{2,3}. Here CVD grown MoS₂ with different defect densities was functionalized with three molecules, 4-aminothiophenol, 4-nitrothiophenol, and biphenyl-4-thiol. The molecules' efficacy in functionalizing the MoS₂ was probed by X-ray photoelectron spectroscopy, Raman and photoluminescence spectroscopies.

References

[1] Hong, J. H., et al., Nat. Commun., 6, 6293 (2015)

[2] Sim, D.M., et al., ACS Nano 9, 12, 12115-12123 (2015)

[3] Syari'ati, A., et al., Chem. Commun., 55, 10384-10387 (2019)

Figures

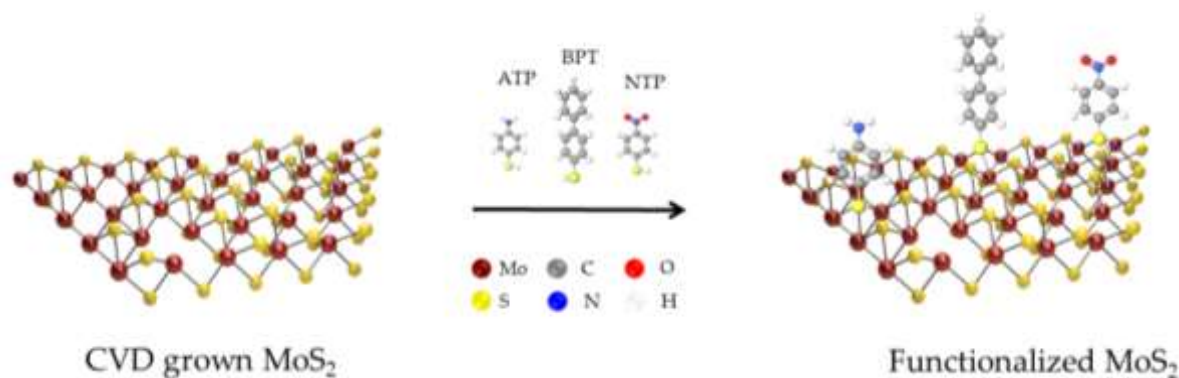


Figure 1: Schematic illustration of surface functionalization using thiol-bearing molecules on CVD grown MoS₂.