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## **Formation of polymeric Ohmic contact with benzyl viologen for two-dimensional semiconductor devices**

Two-dimension (2D) materials electronic performance is limited by the contact resistance of metallic interface and therefore their inherent novel properties are rarely realized experimentally<sup>[1][2]</sup>. Here, we demonstrate that we can largely reduce the contact resistance induced between metal and 2D materials, by controlling the surface condition of 2D materials, eg. surface pinning behavior and prior doping on the contact part. To improve the carrier transport modes, we engineer the surface condition with benzyl viologen and therefore modulate the fermi level of the 2D materials in contact with metal. As a result, electrical contact resistance of the metal interface is significantly reduced and carrier mobility in the device level is enhanced correspondingly.

### **References**

- [1] Dewu Yue, C.H. Ra, X.C. Liu, D. Y. Lee and Won Jong Yoo, *Nanoscale*, 7 (2015) 825-831.
- [2] Dewu Yue, Daeyeong Lee, Young Dae Jang, Min Sup Choi, Hye Jin Nam, Duk-Young Jung and Won Jong Yoo, *Nanoscale*, 8 (2016) 12773-12779.

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