

Abstract Submitted  
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**Modulation of Photoluminescence of Monolayer MoS<sub>2</sub>**<sup>1</sup> ZHENRONG ZHANG, BLAKE BIRMINGHAM, Department of Physics, Baylor University, JIANTAN YUAN, Department of Materials Science and NanoEngineering, Rice University, MATTHIAS FILEZ FILEZ, DONGLONG FU, Inorganic Chemistry and Catalysis Group, Utrecht University, JUN LOU, Department of Materials Science and NanoEngineering, Rice University, JONATHAN HU, Electrical Computer Engineering, Baylor University, BERT WECKHUYSEN, Inorganic Chemistry and Catalysis Group, Utrecht University — Modulation of photoluminescence (PL) of two-dimensional materials is important for its optoelectronic and catalysis applications. We have systematically studied the effect of thermal and photo-reaction of various ambient molecules (H<sub>2</sub>O, O<sub>2</sub>, and N<sub>2</sub>) on the photoluminescence of CVD grown monolayer MoS<sub>2</sub>. The results show that the photoreaction of the O<sub>2</sub> with MoS<sub>2</sub> monolayer can affect the PL intensity. For the application of desulfurization of gasoline, we compared the difference in the interaction of pyridine molecules with monolayer MoS<sub>2</sub>. Our results show that liquid pyridine and gaseous pyridine interact differently with MoS<sub>2</sub> monolayers.

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