

Supporting Information

Reversible room temperature H₂ gas sensing based on self-assembled cobalt oxysulfide

**Hui Zhou¹, Kai Xu^{2,*}, Nam Ha², Yinfen Cheng¹, Rui Ou², Qijie Ma², Yihong Hu², Vien Trinh²,
Guanghui Ren², Zhong Li^{1,*}, Jian Zhen Ou^{1,2,*}**

¹ Key Laboratory of Advanced Technologies of Materials, Ministry of Education, School of Materials Science and Engineering, Southwest Jiaotong University, Chengdu 610031, China

² School of Engineering, RMIT University, Melbourne, Victoria 3000, Australia

* Correspondence: kai.xu@rmit.edu.au (K.X.); zhong.li@swjtu.edu.cn (Z.L.); jianzhen.ou@rmit.edu.au (J.Z.O.)

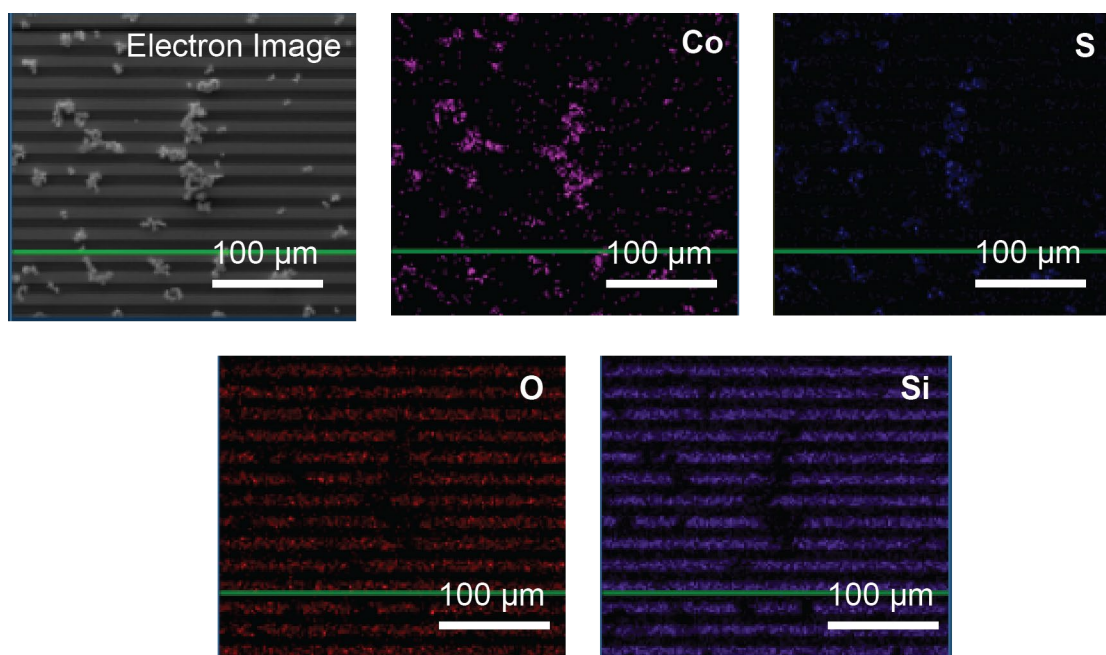


Figure S1. EDS measurement of the hexagonal cobalt sulfide particles upon a SiO_2 substrate.

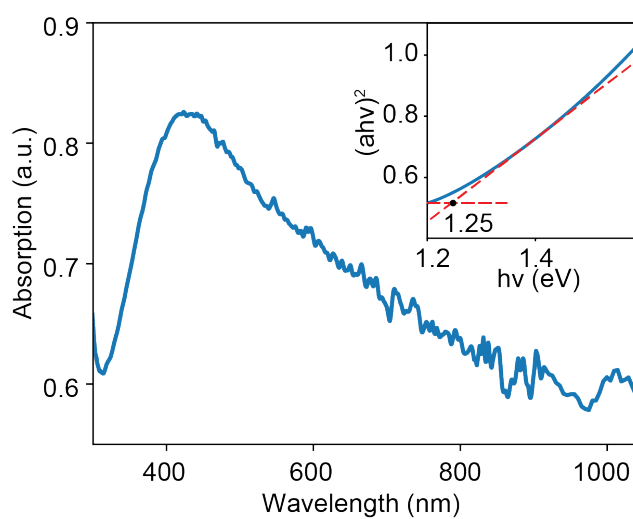


Figure S2. UV-Vis-NIR absorption spectra of CoS with the corresponding Tauc-plot in the inset.

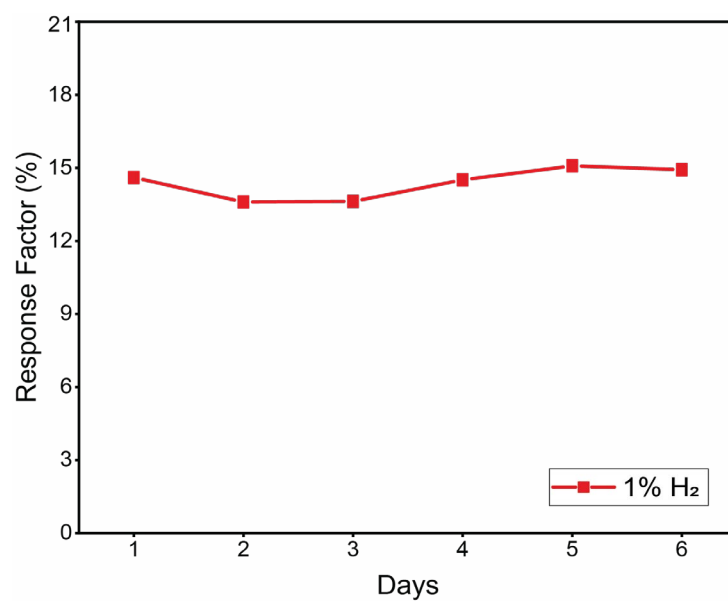


Figure S3. Long term stability experiment for cobalt oxysulfide sensor towards 1% H₂ for a week.

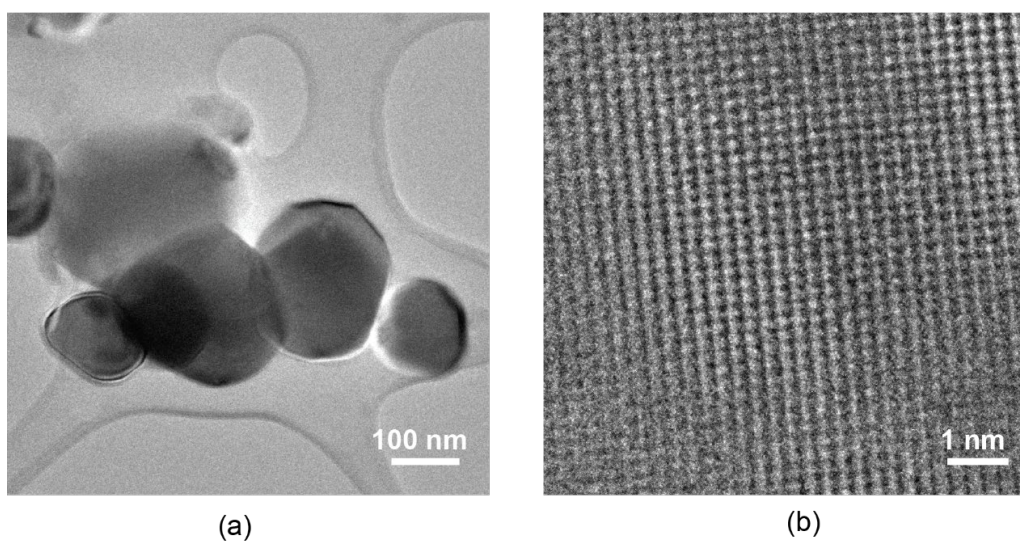


Figure S4. (a) Low resolution TEM and (b) HRTEM images for cobalt oxysulfide taken after long-term stability test.

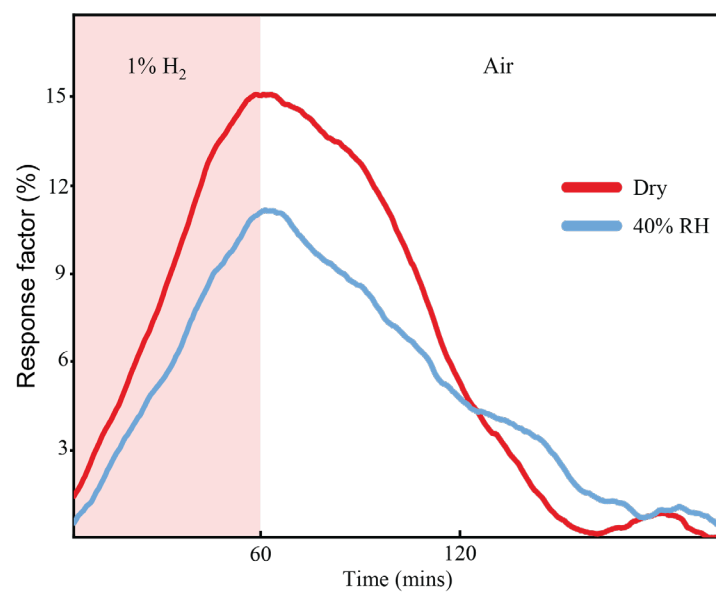


Figure S5. The response curve of cobalt oxysulfide sensor towards 1% H₂ in the dry, and 40% RH.