Electronic Supplementary Material (ESI) for RSC Advances.
This journal is © The Royal Society of Chemistry 2016

Supporting Information

Mechanically-induced Reverse Phase Transformation of MoS_2 from Stable 2H to Metastable 1T and Its Memristive Behavior

Peifu Cheng,[†] *Kai Sun,*[‡] *and Yun H. Hu**[,†]

[†]Department of Materials Science and Engineering, Michigan Technological University, Houghton, Michigan 49931-1295, United States

[‡]Department of Materials Science and Engineering, University of Michigan, Ann Arbor, Michigan 48109-2136, United States

Content:

- *I–V* characteristic of bulk MoS_2 based device (Figure S1)
- FE-SEM morphology images of MoS_2 with and without ball-milling (Figure S2)
- TEM images of MoS_2 with and without ball-milling (Figure S3)
- AFM image and corresponding height profile of MoS_2 with and without ball-milling (Figure S4)

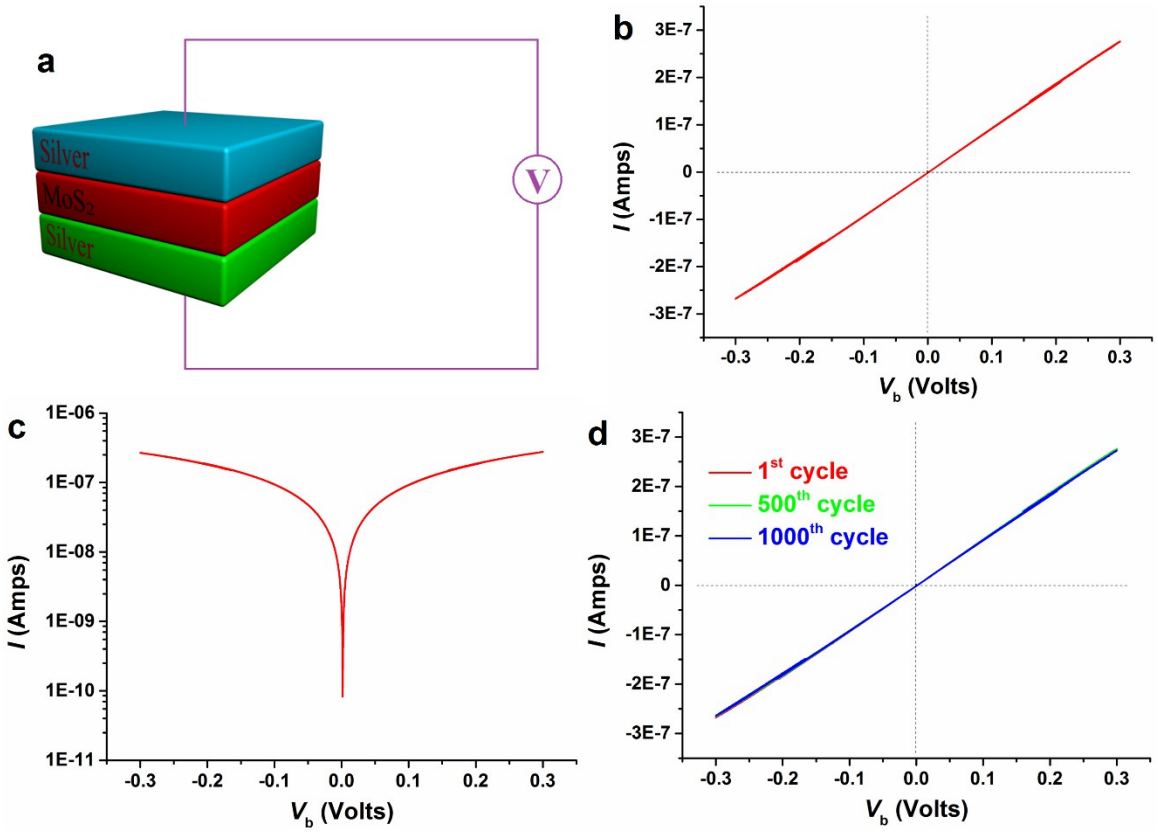

Figure S1. *I–V* characteristic of bulk MoS_2 based device. (a) Schematic structure of bulk MoS_2 based device. (b) Typical *I–V* characteristic of bulk MoS_2 based device at room temperature. (c) Typical *I–V* characteristic of bulk MoS_2 based device in the logarithmic scale at room temperature. (d) Typical *I–V* characteristic of bulk MoS_2 based device at the 1st (red), 500th (green), and 1000th (blue) cycle at room temperature.

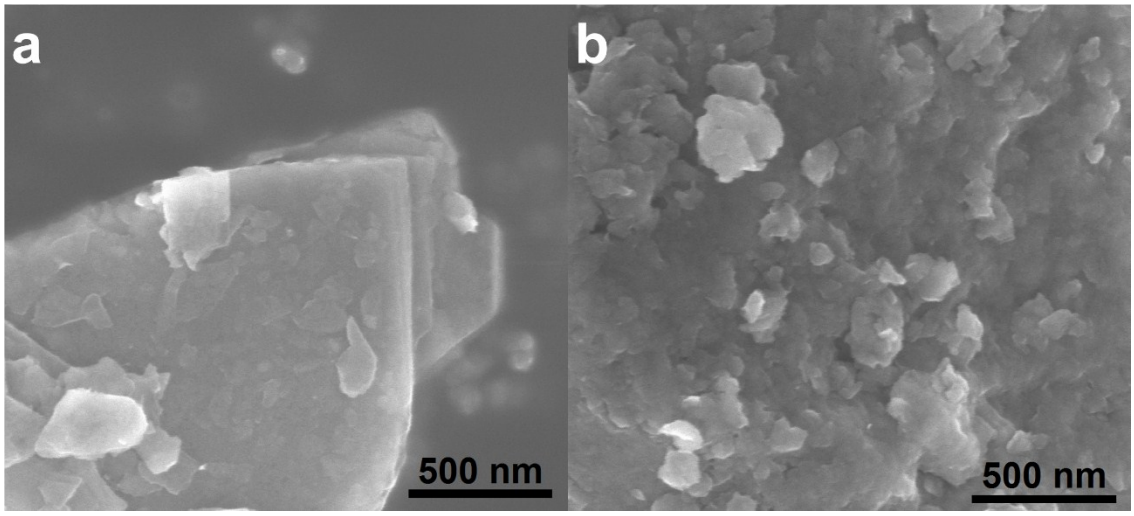

Figure S2. FE-SEM morphology image of (a) bulk MoS_2 and (b) MoS_2-bm-5h nanoparticles.

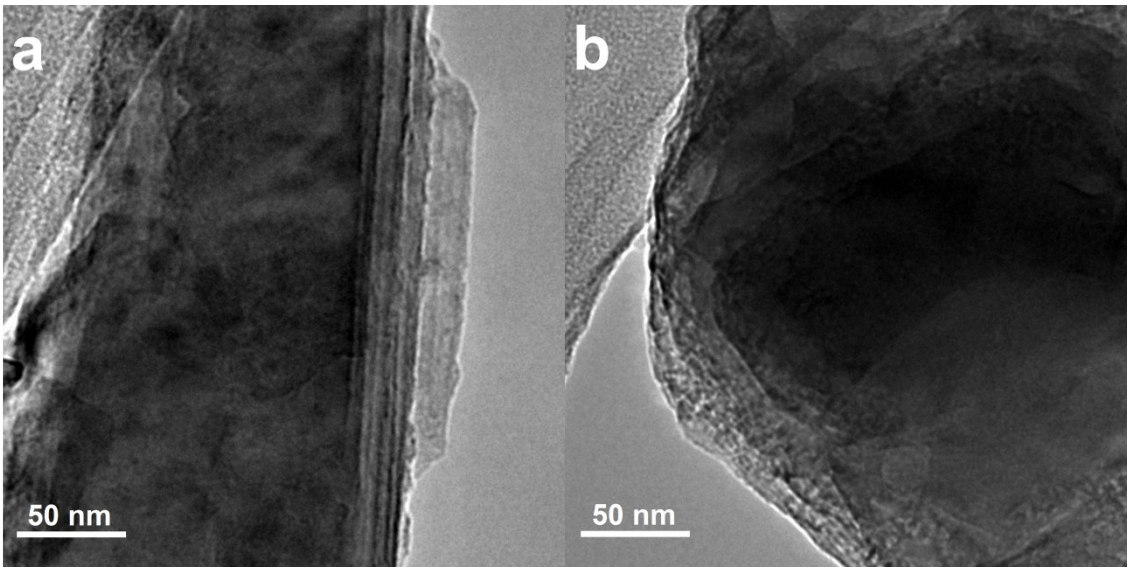

Figure S3. TEM image of (a) bulk MoS_2 and (b) MoS_2-bm-5h nanoparticles.

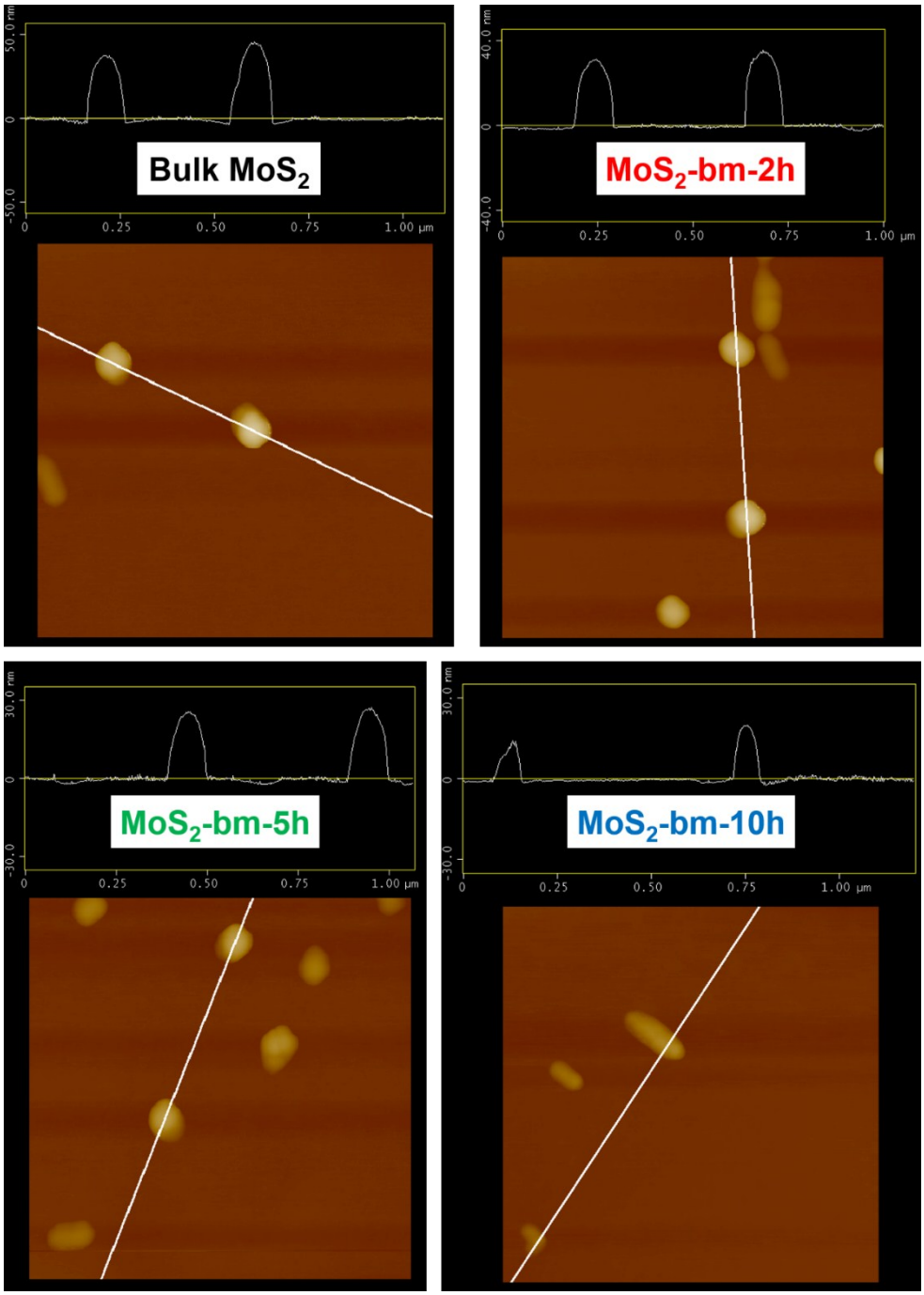

Figure S4. AFM image and corresponding height profile of bulk MoS_2, MoS_2-bm-2h, MoS_2-bm-5h, and MoS_2-bm-10h.