Electronic Supplementary Material (ESI) for Nanoscale.

Supporting Information

Plasmon-enhanced MoS2Photocatalysis in Hydrogen Evolution

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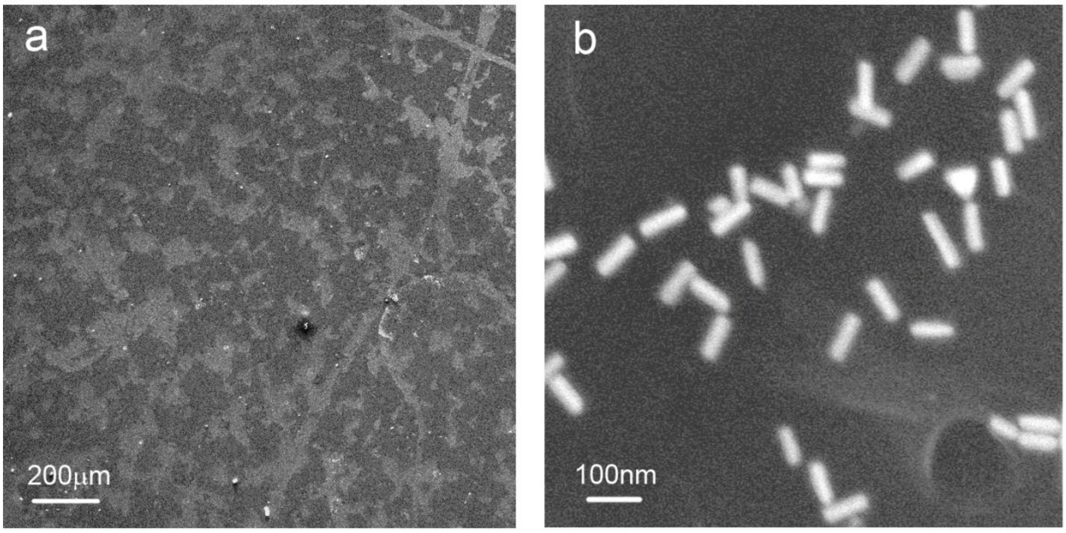

Figure S1. Scanning electron microscope (SEM) images of a) the as-grown 2H-MoS_2 on Si substrate and b) Ag@Au nanorattles. The dense MoS_2 samples ensure a high catalytic efficiency in hydrogen evolution reactions.The coupling between different Ag@Au nanorattles can be negligible for few clusters are formed, and thus keeps the resonance peek at 690nm.

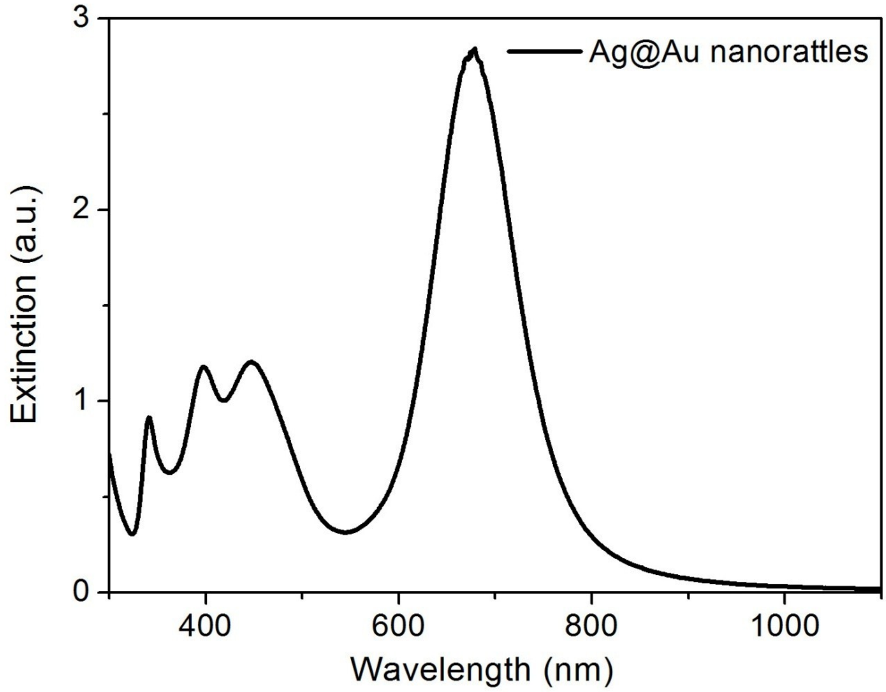

Figure S2. Extinction spectrum of Ag@Au nanorattles. The nanorattle exhibits both a longitudinal plasmon resonance at 690nm and a transverse mode around 420nm according to different incident laser polarization. These small peaks are the coupling modes. At 532nm, the Ag@Au nanorattles are off- resonant.

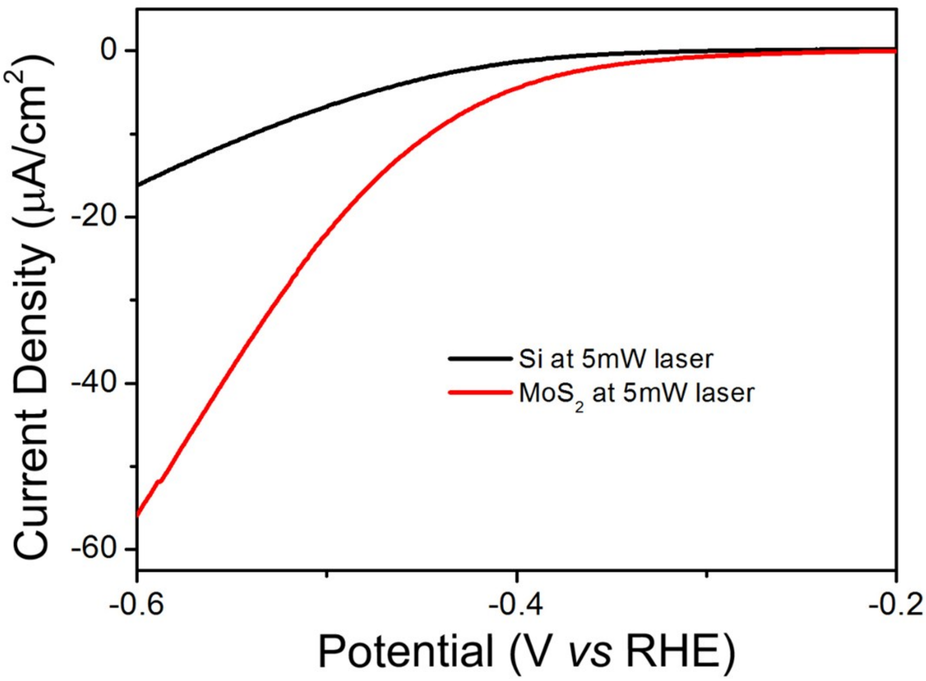

Figure S3. HER polarization curves under 690nm laser illumination, for Si and MoS_2, respectively. Due to the imperfect conductivity of silicon, the HER performance is poor, but the catalytic performance of MoS_2 can be measurable.

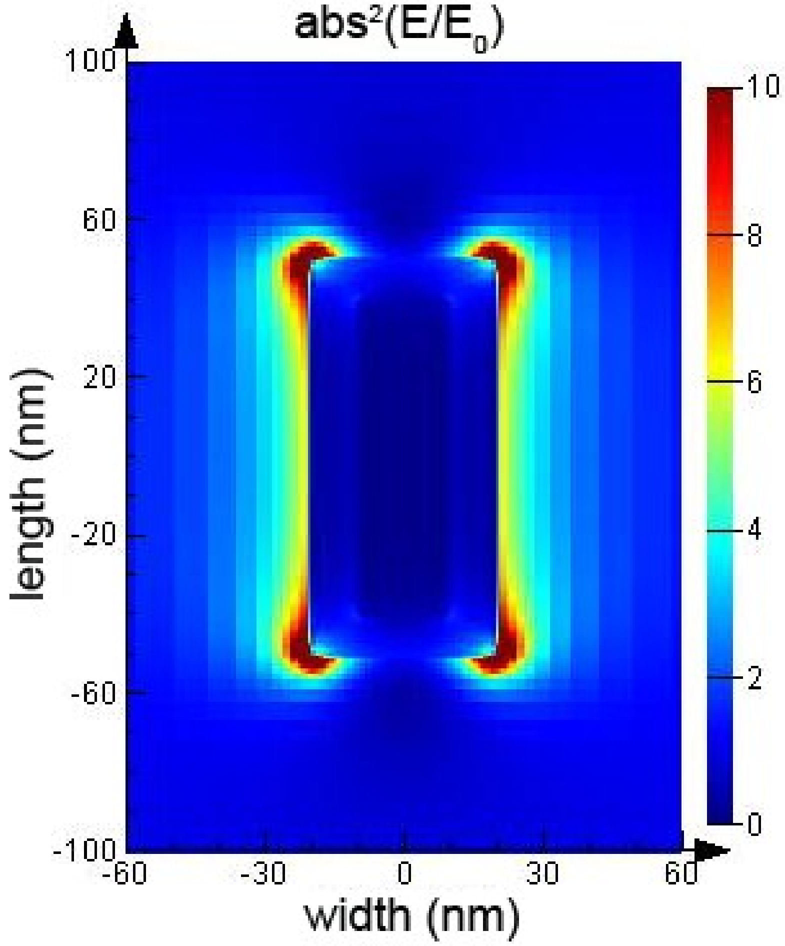

Figure S4. Calculated near-field optical intensity map of Ag@Ag nanorattles with a length of 100nm and width of 40nm by FDTD simulation.

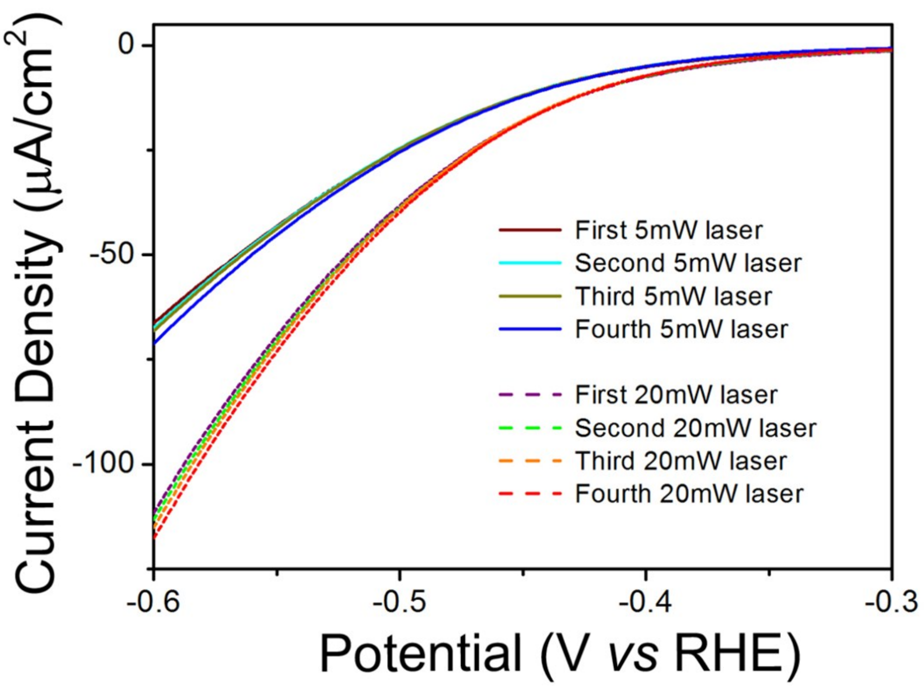

Figure S5. HER polarization curves under 690nm laser illumination, for MoS_2 monolayer with Ag@Au nanorattles. At a certain power, the phase transition gets saturated with the polarization curves keep similar at the first and fourth measurement.