Ultralow Ru incorporated MoS$_2$ nanosheet arrays for efficient
electrocatalytic hydrogen evolution in dual-pH

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Figure S1 EDS spectrum of MoS$_2$/CC.

Figure S2 EDS spectrum of 0.005-MoS$_2$/CC.
Figure S3 EDS spectrum of 0.01-MoS$_2$/CC.
Figure S4 EDS spectrum of 0.015-MoS$_2$/CC.
Figure S5. CV curves for (a) CC, (a) MoS$_2$/CC, (b) 0.005-Ru-MoS$_2$/CC, (c) 0.01-Ru-MoS$_2$/CC and (d) 0.015-Ru-MoS$_2$/CC at different scan rates with 20, 40, 60, 80, and 100 mV s$^{-1}$ in 0.5 M H$_2$SO$_4$. 
Figure S6. CV curves for (a) CC, (a) MoS$_2$/CC, (b) 0.005-Ru-MoS$_2$/CC, (c) 0.01-Ru-MoS$_2$/CC and (d) 0.015-Ru-MoS$_2$/CC at different scan rates with 20, 40, 60, 80, and 100 mV s$^{-1}$ in 1 M KOH.
Figure S7. Polarization curves of all synthesized catalysts with carbon plate as the counter electrode

(a, b) 0.5 M H$_2$SO$_4$, (b, c) 1M PBS and (e, f) 1M KOH.
Figure S8. Stability curves and polarization curves of 0.01-Ru MoS$_2$/CC at 30 mA cm$^{-2}$ for 50 h in (a, b) 0.5 M H$_2$SO$_4$ and (c, d) 1.0 M KOH with carbon plate as the counter electrode.

Figure S9. SEM images of 0.01-Ru MoS$_2$/CC after HER stability test at 30 mA cm$^{-2}$ for 50 h in (a) 0.5 M H$_2$SO$_4$ and (b) 1 M KOH solution, respectively.