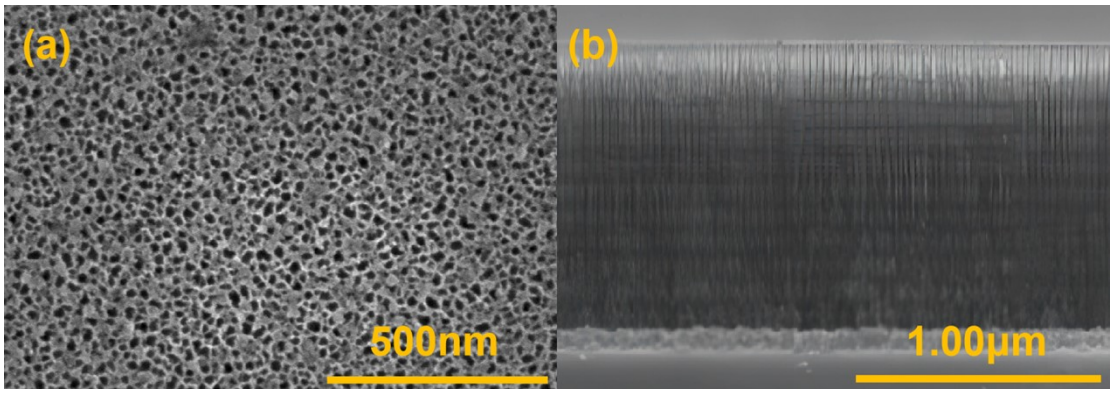

Fig. 1(a) Surface SEM image of a Bragg-PSi substrate.
Fig. 1(b) Cross-sectional SEM image of a Bragg-PSi substrate.

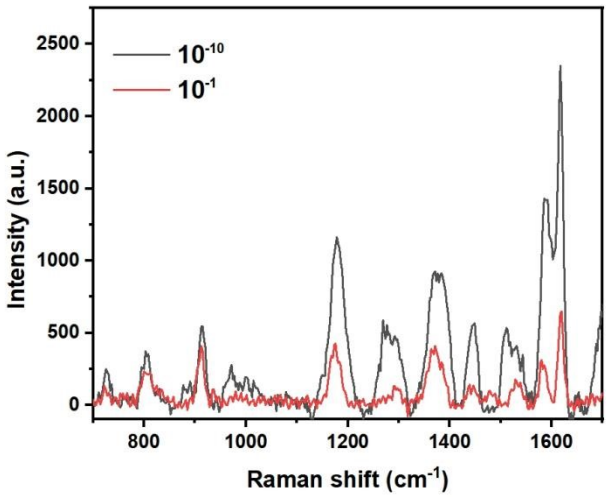

Fig. 2 The normal Raman spectra of 10^{-1}M CV and the SERS spectra of 10^{-10}M CV

As illustrated in Fig. 2, to determine the enhancement factor (EF) for the CuNPs/AgNPs/Bragg-PSi SERS substrate, we conducted measurements of the SERS spectrum for 10^{-10}M CV and the standard spectrum for 10^{-1}M CV. Subsequently, based on the characteristic peak at 1617 cm^{-1} in CV Raman spectrum, we calculate the EF of SERS for substrate based on $EF = (I_s \times C_0)/(C_s \times I_0)$. I_s is the SERS signal intensity of CV with a concentration of 10^{-10}M, and I_0 is the Raman signal intensity of CV with a concentration of 10^{-1}M CV on a bare silicon wafer. According to the formula, the EF of CuNPs/AgNPs/Bragg-PSi is 3.64×10^{11}.