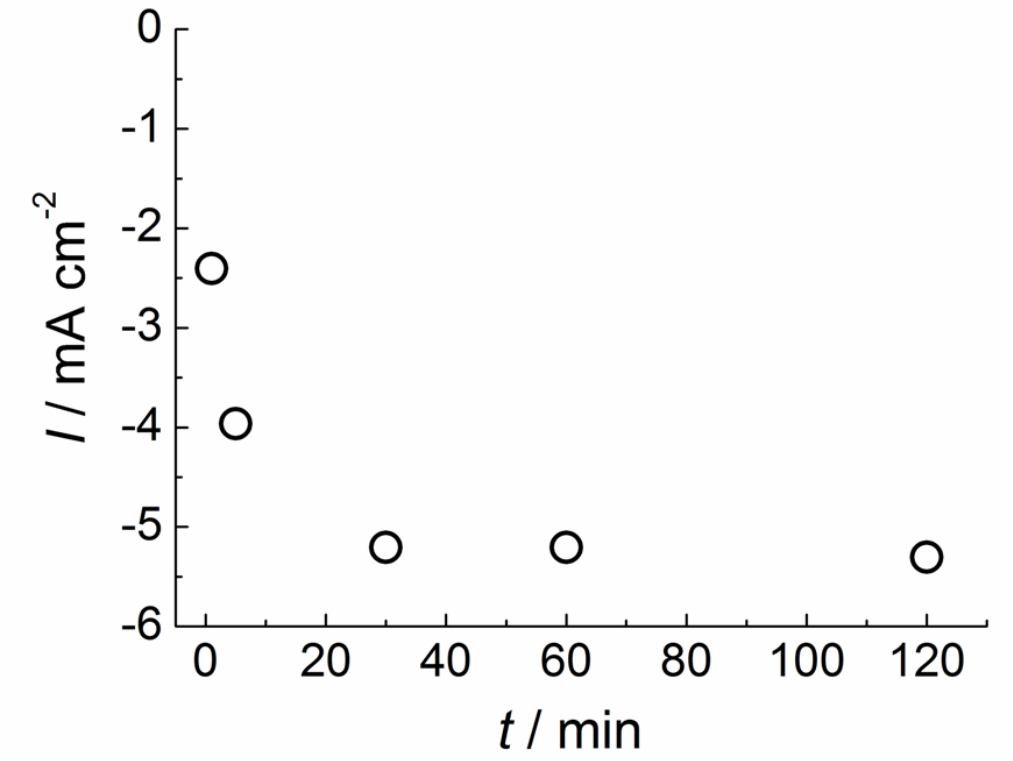

Fig. S1 The adsorption time dependence of BOD on O_2-reduction current density. The catalytic current was measured at 0 V from cyclic voltammograms under stirring at 4,000 rpm.

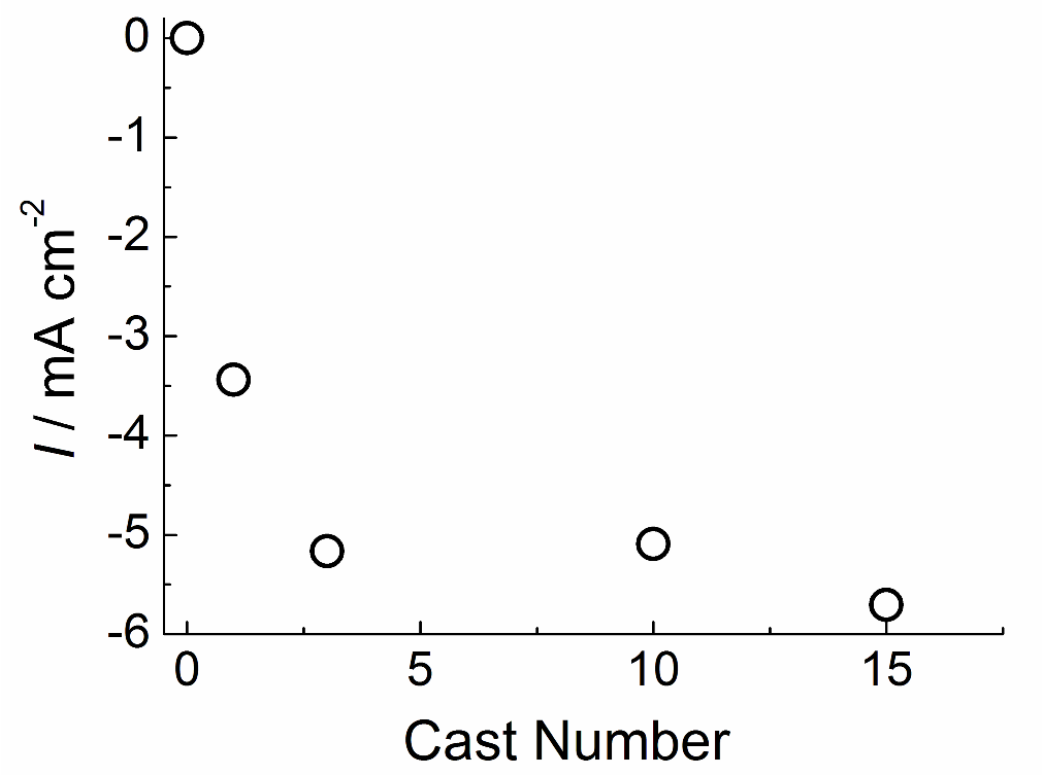

Fig. S2 Cast number dependence of AuNPs on O_2-reduction current. The catalytic current was measured at 0 V from cyclic voltammograms under stirring at 4,000 rpm.

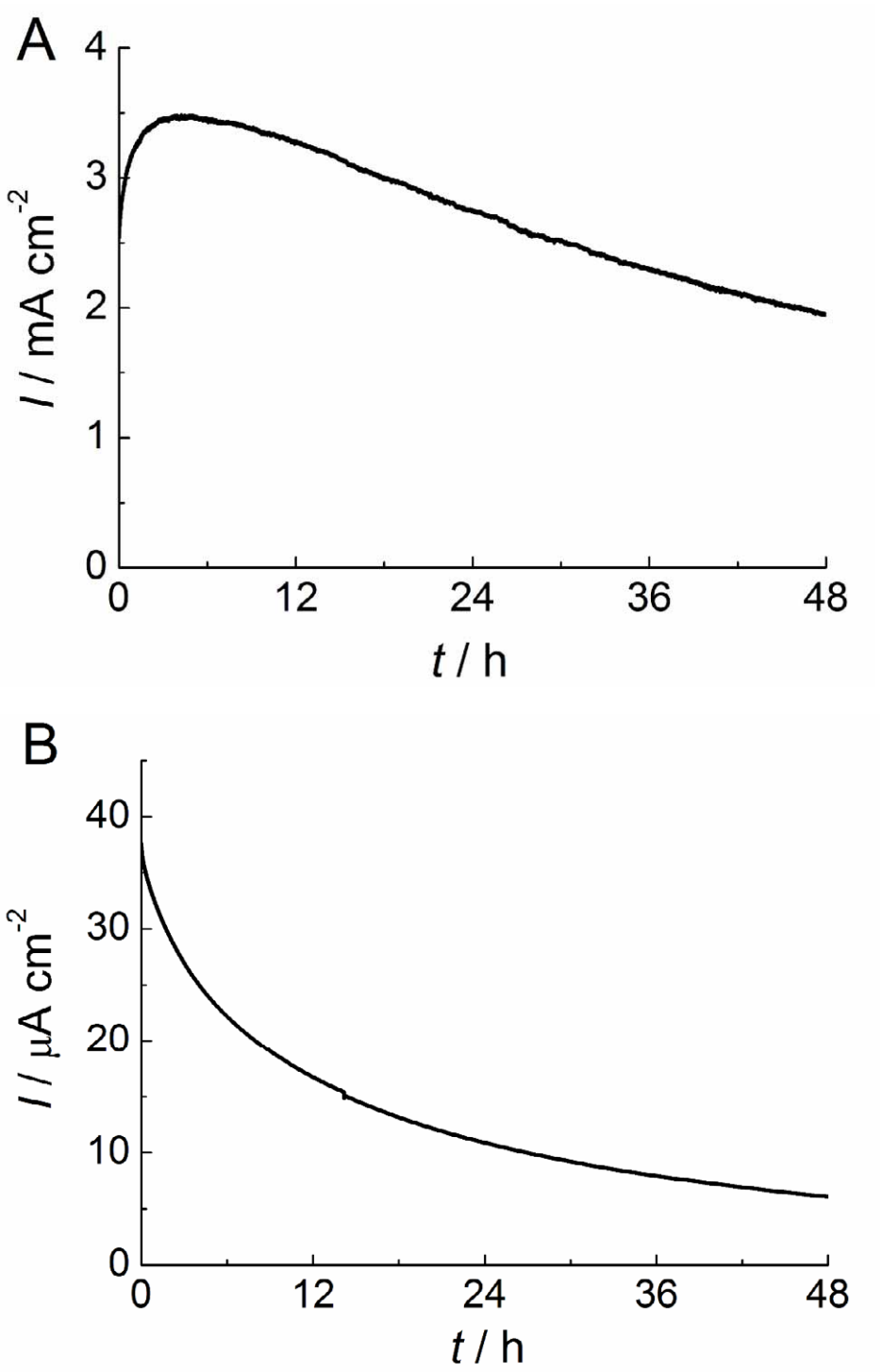

Fig. S3 The stability of the D-fructose reduction current for FDH adsorbed on (A) MET-AuNP/AuE and (B) MET-AuE in 0.1 M acetate buffer at pH 6.0 containing 200 mM D-fructose. The applied potentials were +0.2 V. For FDH at MET-AuNP/AuE, the current density increased over time to 1.4 fold of the initial value after 3 h, and then gradually decreased. The reason for the increased current is not clear, but one explanation is that an applied potential-induced orientation change of the enzyme at the electrode occurred and facilitated the DET reaction between the electrode and enzyme.