**Supporting Information**

# Fast immobilization of human carbonic anhydrase II on Ni-based metal-organic framework nanorods with high catalytic performance

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**Table S1** The amount of immobilized His-hCA II.

| Free Enzyme | | Immobilized Enzyme | | | | |
|---|---|---|---|---|---|---|
| Protein (mg/ml) | Specific Activity (U/mg) | Protein in washing | Bound Protein | Total Activity(U) | Specific Activity (U/mg) | Protein Yield (%) |
| 0.4 | 1.96 | 0.273 | 0.127 | 1054.1 | 8296.3 | 31.76 |

**Table S2** Michaelis−Menten kinetics parameters of immobilized and free enzymes

| | $K_m$ (mmol/L) | $V_{max}$ (mmol/min) |
|---|---|---|
| Free enzyme | 1.82 | 0.037 |
| Immobilized enzyme | 1.96 | 0.035 |

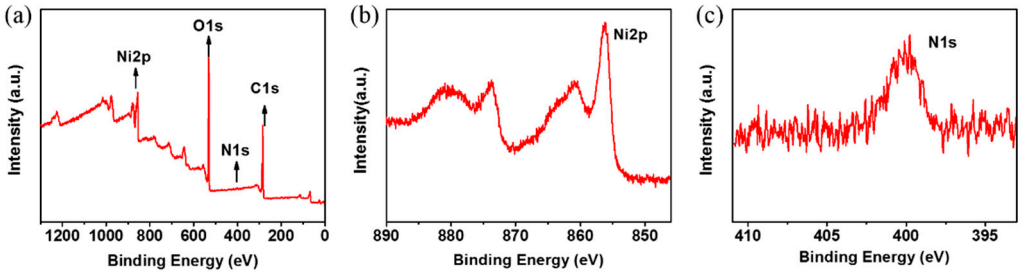


**Figure S1** XPS spectra of Ni-BTC nanorods: (a) full scan, (b) Ni 2p, (c) N 1s.

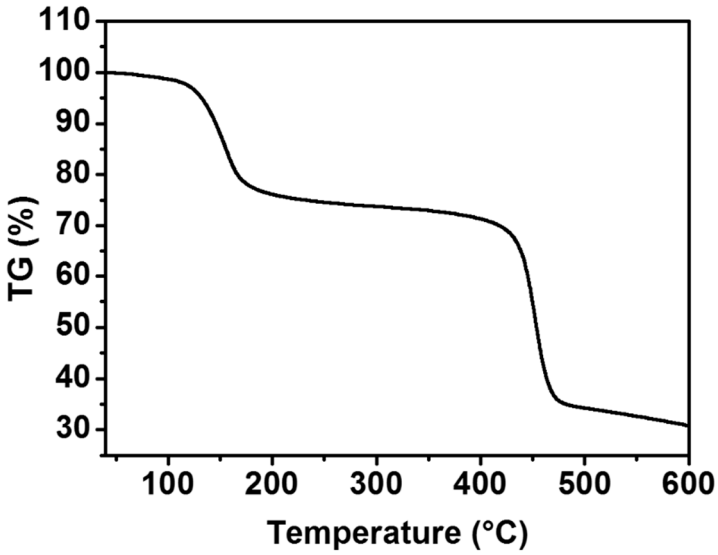


**Fig. S2.** TG curves of Ni-BTC.

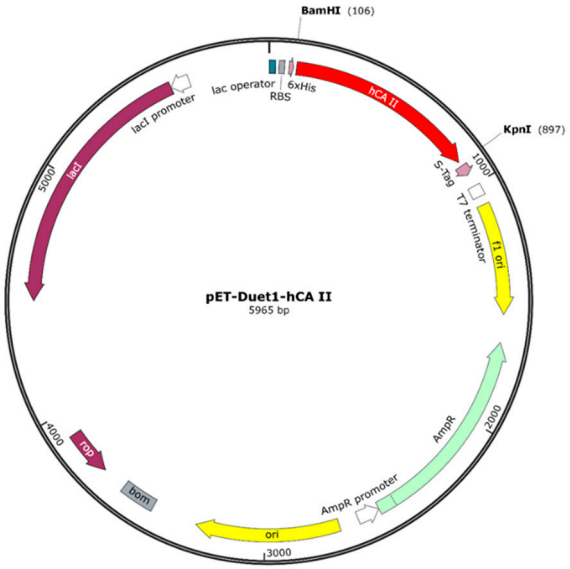


**Fig. S3.** The plasmid map of pETDuet-1-His-hCA II.

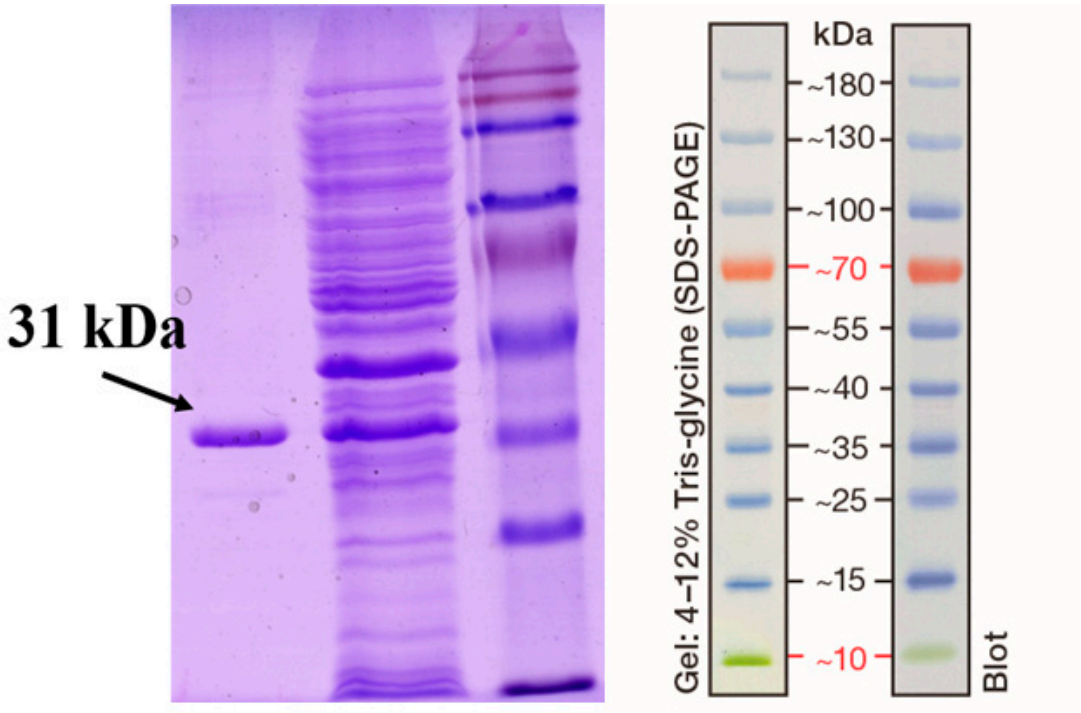


**Fig. S4.** SDS-PAGE of purified the recombinant hCA II from the culture supernatant. (Lane 1: His6-tagged hCA II purified using Ni-NTA column, Lane 2: supernatant of hCA II cell lysate, Lane 3: molecular weight marker)

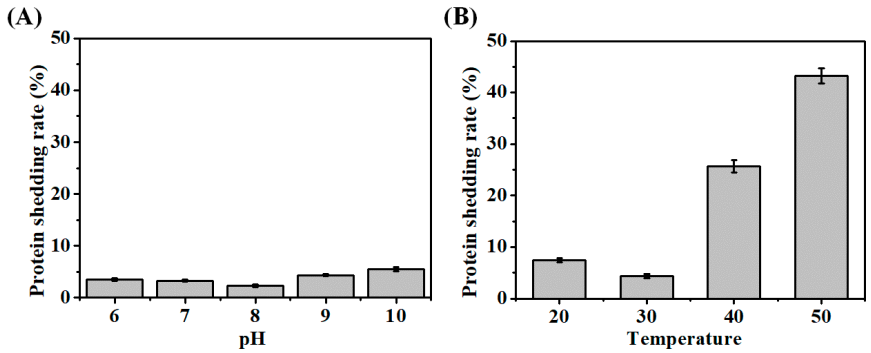


**Fig. S5.** (A) The protein shedding rate of immobilized enzyme at different pH and (B) the protein shedding rate of immobilized enzyme at different temperatures.

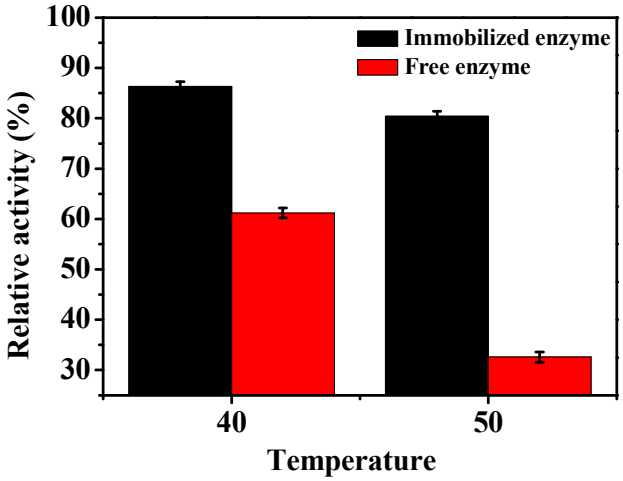


**Fig. S6.** The catalytic activity of His-hCA II@Ni-BTC and free enzyme at the same protein concentration was studied at 40 ℃ and 50 ℃.

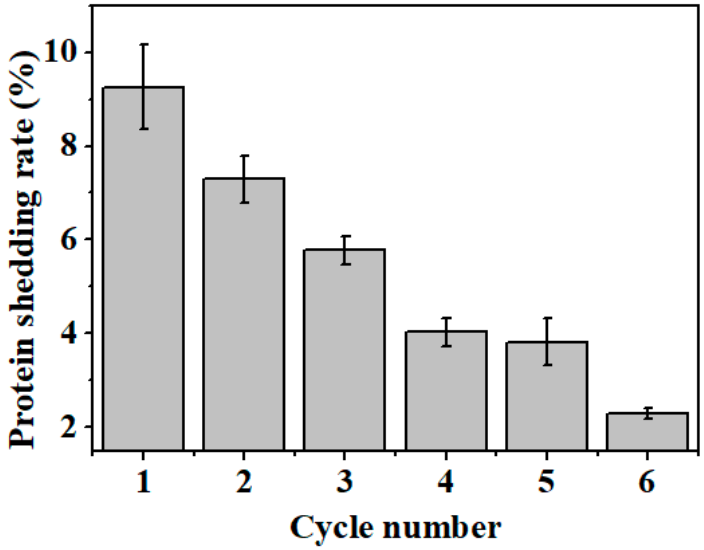


**Fig. S7.** The protein shedding rate of cycle process

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