Electronic Supplementary Material (ESI) for Analytical Methods.

Table S1 Operation parameters of iCAP 7400 ICP-OES.

Parameter	Value	
RF power (W)	1150	
Auxiliary gas flow rate (L min^{-1})	0.5	
Carrier gas flow rate (L min^{-1})	0.6	
Coolant gas flow rate (L min^{-1})	12	
Frequency of RF generator (MHz)	27.12	
Exposure time (s) Axial	Low (UV)	High (Visible)
	20	10
Analytical wavelength (nm)	Au 242.795	

Table S2 Details of certified reference materials.

Sample	Description of certified reference materials	Sources
WMS-1a	Massive sulphide PGE material	Canada Centre for Mineral and Energy Technology (CANMET), Hamilton
MA-2c	Siliceous gold ore	CANMET, Hamilton
GAu 14	Soil from carbonate rock with micrograined gold	Institute of Geophysical and Geochemical Exploration (IGGE), China
GAu 16	Poor ore from altered sandstone gold deposit	IGGE, China
GAu 18	Rich ore from hydrothermal metasomatic gold deposit in shattered fault belt	IGGE, China

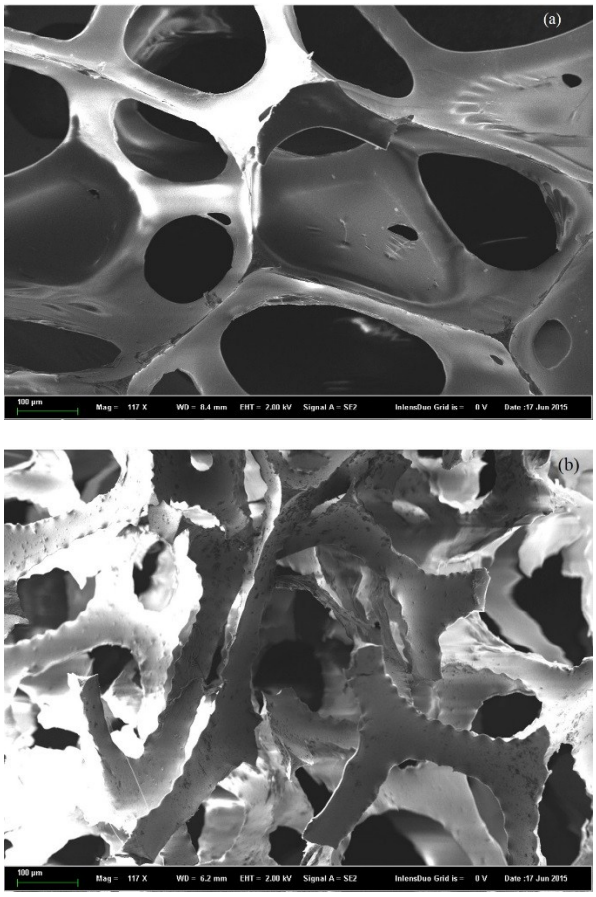


Fig. S1 SEM images of (a) PUF, (b) PUF-Cyt.

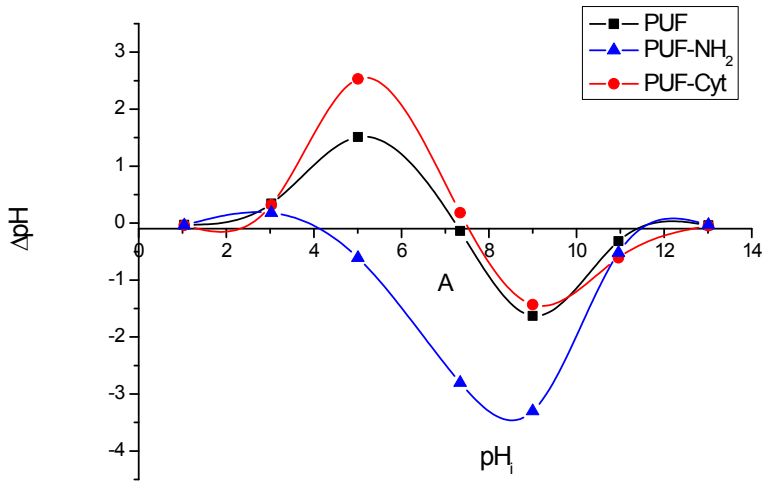


Fig. S2 Zero point charge pH (pH_{ZPC}) of PUF, PUF-NH_2 and PUF-Cyt

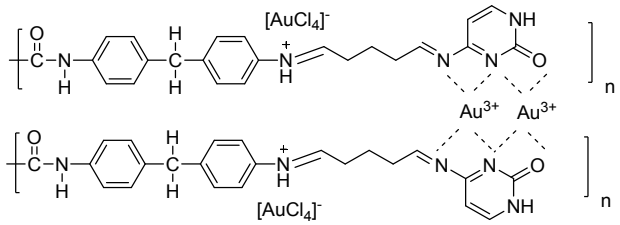
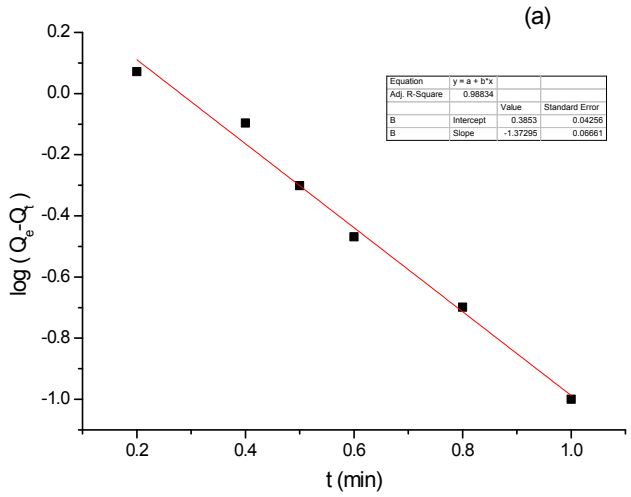
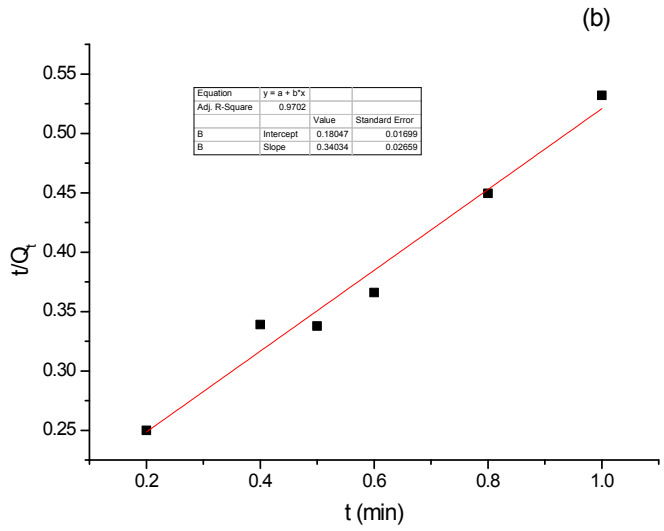


Fig. S3 Mechanism of complex formation.





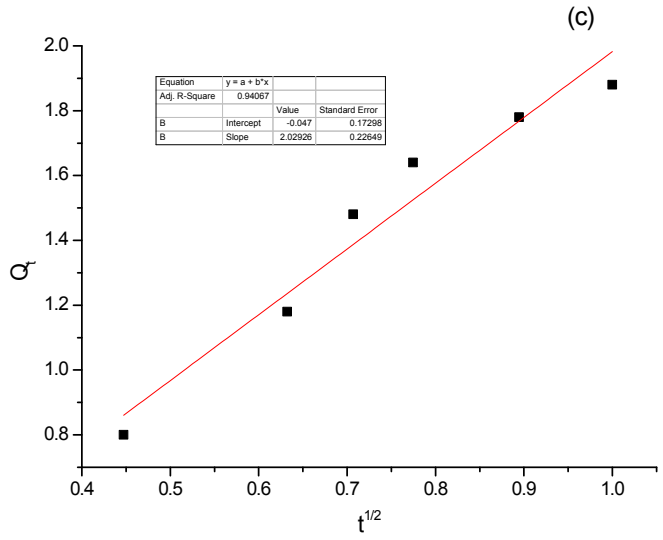
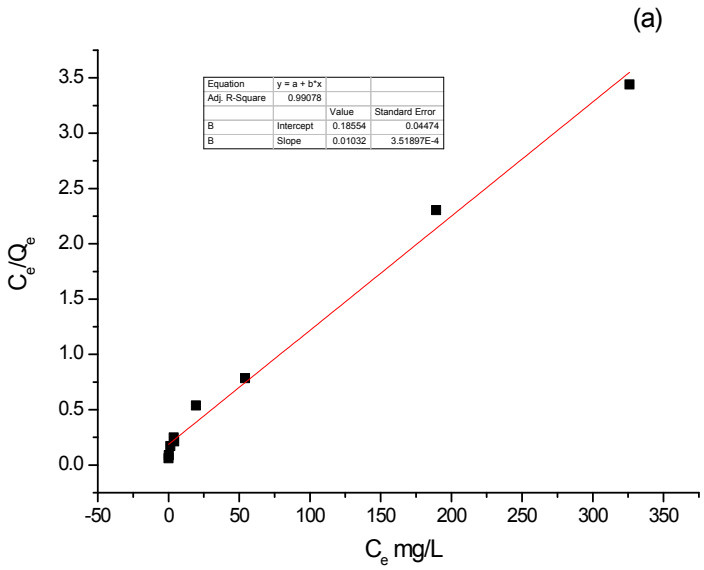


Fig. S4 Kinetics of sorption of Au(III) onto PUF-Cyt: (a) pseudo-first-order; (b) pseudo-second-order; and (c) intraparticle diffusion



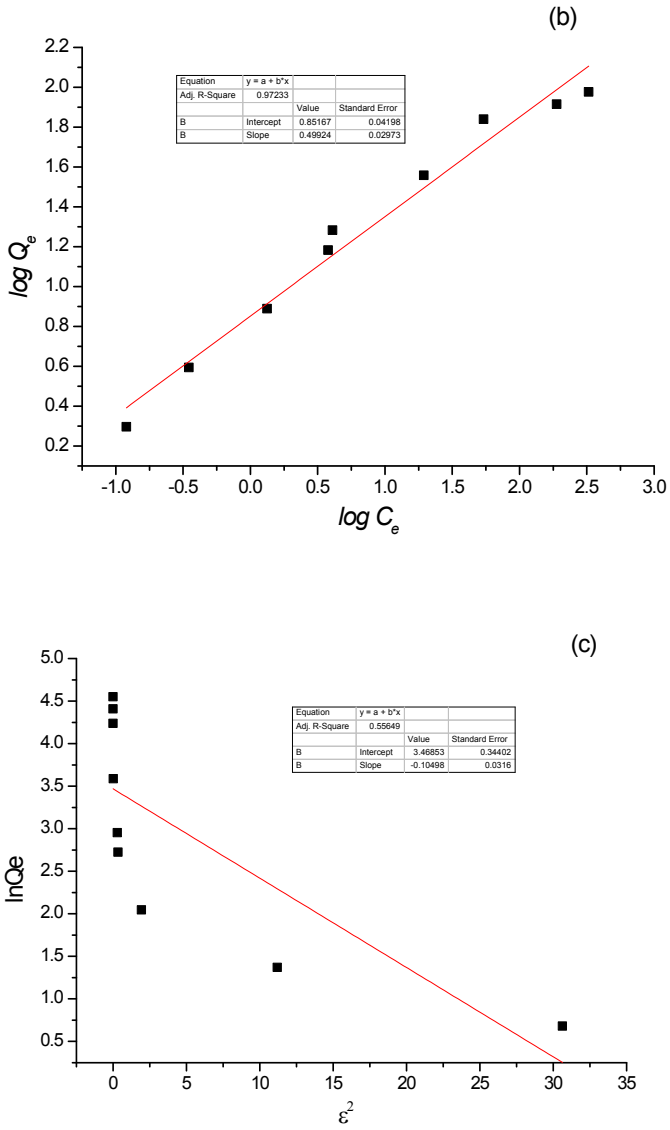


Fig. S5 (a) The Langmuir sorption isotherm for batch method, (b) the Freundlich sorption isotherm for batch method and (c) the D–R sorption isotherm for batch method (temperature: 25 °C).

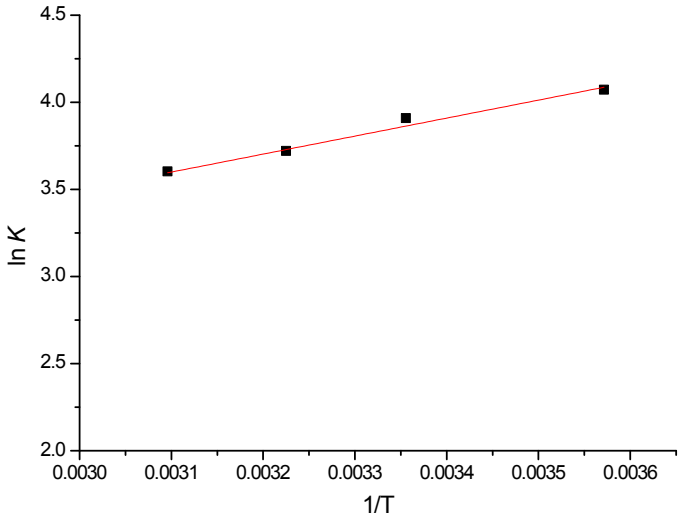


Fig. S6 The plot of ln *K* versus 1/T for the determination of thermodynamic parameters for adsorption of Au(III) on the PUF-Cyt.

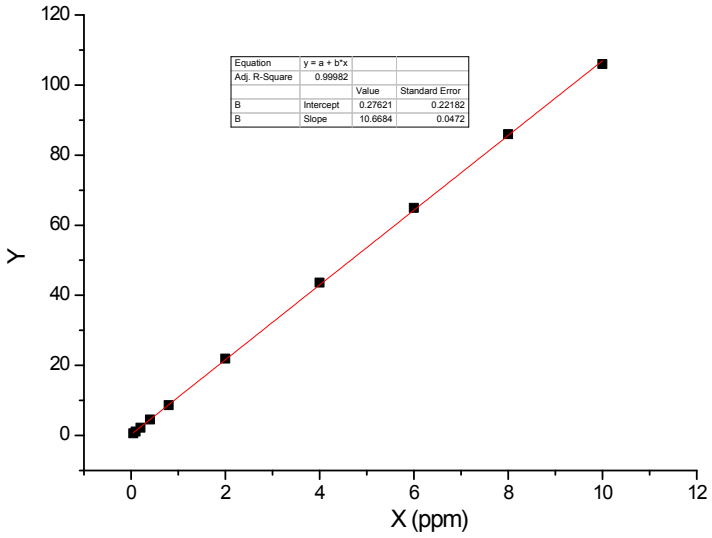
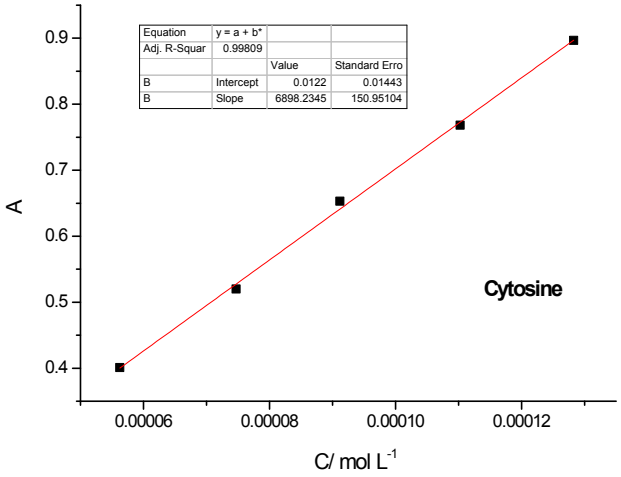


Fig. S7 Calibration curves for gold.



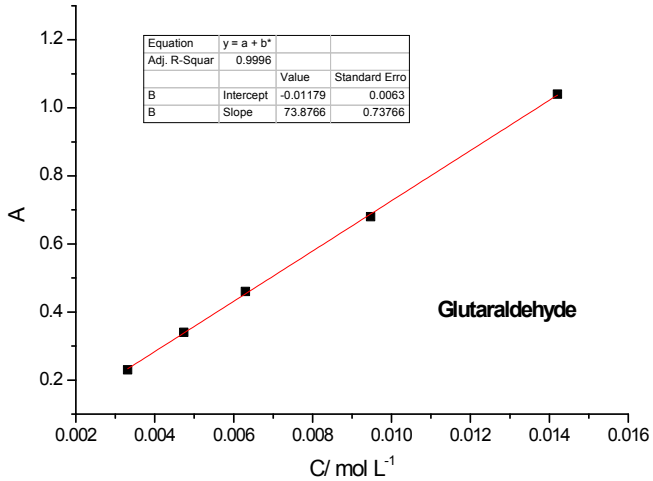


Fig. S8 Absorbance versus concentrations of cytosine and glutaraldehyde.

The mass fraction of cytosine moiety in the PUF-Cyt is nearly 8.7%. The average loading of the ligands was estimated by subtraction method: (i) The concentration of Cyt in the phosphate buffer after reaction was calculated according to the Beer's law using an extinction coefficient of 6898 M^{-1} cm^{-1} at 267 nm. (ii) Using the calibration curve constructed from 6 standards of different concentrations of Cyt in phosphate buffer, the extinction coefficient of the Cyt (ε_{Cyt}) was derived as 345 M^{-1} cm^{-1}. Thus, the concentration of residual Cyt molecules in the supernatant was calculated according to ε_{Cyt}. (iii) The amount of Cyt bound to the surface of PUF was concluded from the

difference of the amount of Cyt molecules in the incubation solution and the amount of unbounded Cyt measured in the supernatant after reaction. The maximum absorption wavelength and the extinction coefficient of glutaraldehyde are 234 nm and 73.87, respectively. The two absorption peaks of Cyt and are non-overlapping. In addition, the initial feed molar ratio of Cyt to glutaraldehyde is 1:5, while the extinction coefficient of Cyt much higher than glutaraldehyde. The signal of residual glutaraldehyde is too low to interfere the determination. According to the above data, the 5% of Cyt is left, which means 0.095 g of Cyt was modified on PUF. Base on the weight of raw materials, the mass fraction of cytosine moiety in the PUF-Cyt can easily obtained.