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Pyridine Boronic Acid-Polyoxometalate Based Porous Hybrid for Efficient Depletion of High Abundant Glycoproteins in Plasma

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Electronic Supplementary Information

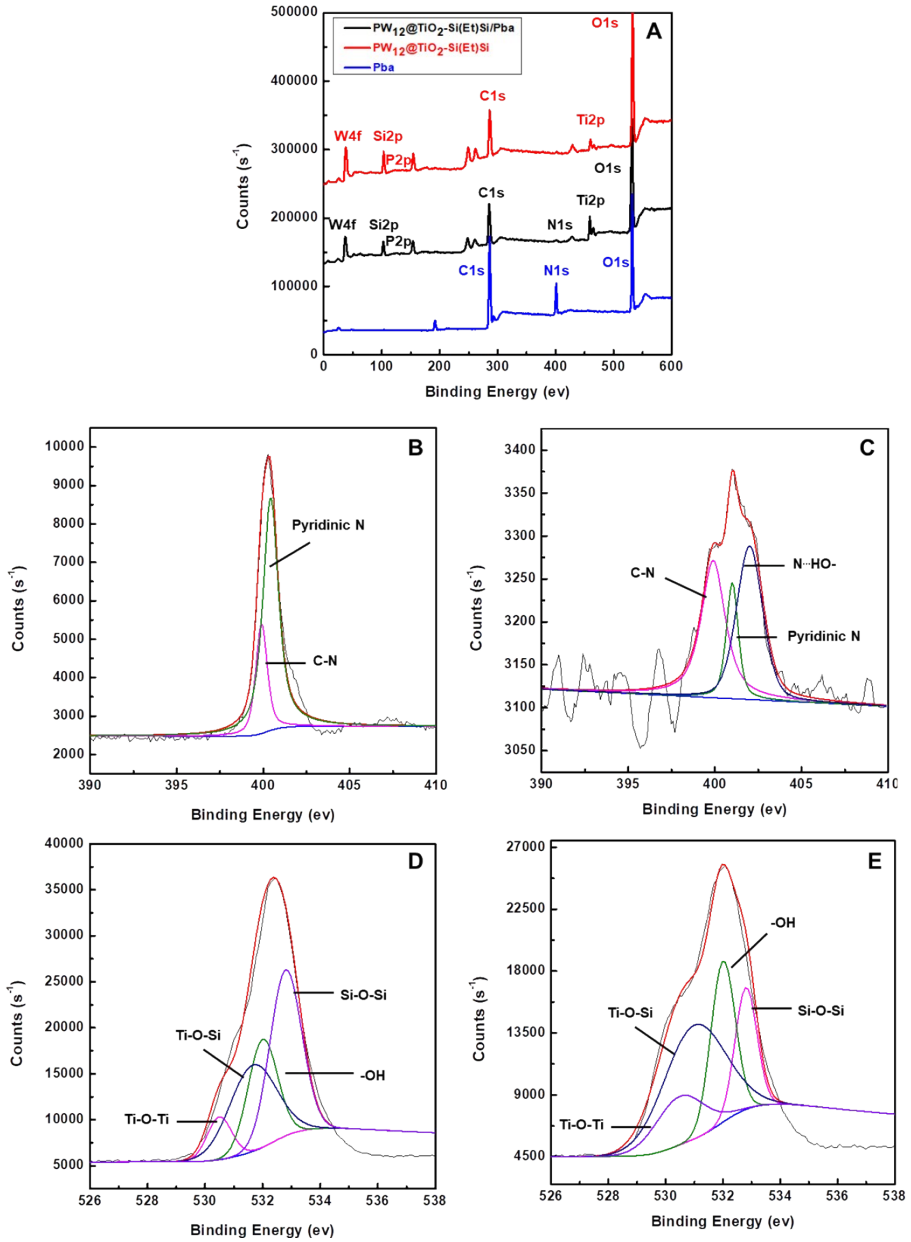

Fig. S1 (A) Full-scan XPS spectrum of PW_{12}@TiO_2-Si(Et)Si and PW_{12}@TiO_2-Si(Et)Si/Pba hybrid; (B) N 1s XPS spectrum of pyridine boronic acid; (C) N 1s XPS spectrum of PW_{12}@TiO_2-Si(Et)Si/Pba hybrid; (D) O 1s XPS spectrum of PW_{12}@TiO_2-Si(Et)Si; (E) O 1s XPS spectrum of PW_{12}@TiO_2-Si(Et)Si/Pba hybrid.

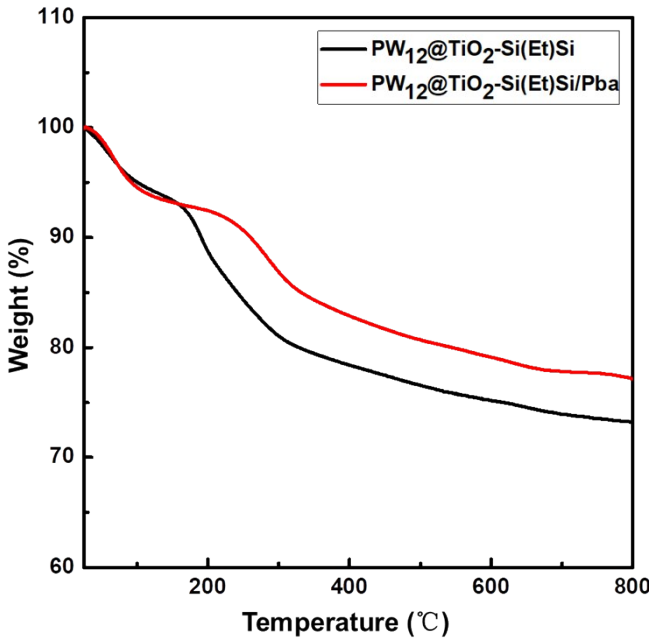

Fig. S2 The TGA curves of PW_{12}@TiO_2-Si(Et)Si and PW_{12}@TiO_2-Si(Et)Si/Pba.

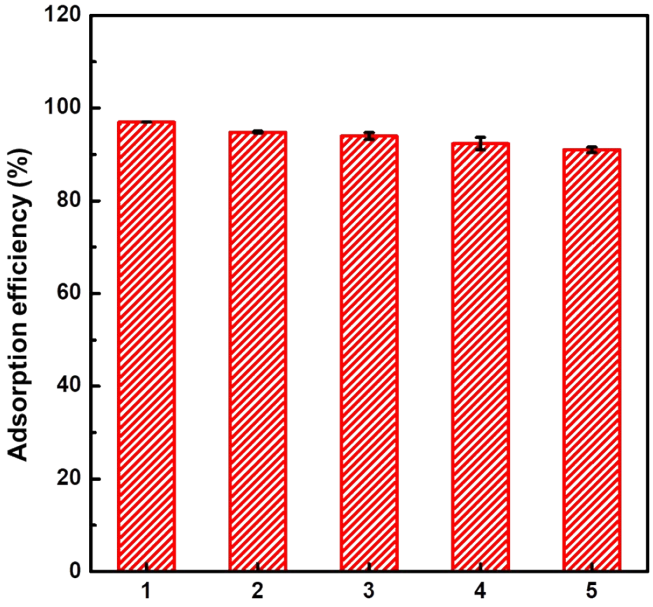

Fig. S3 The reusability of PW_{12}@TiO_2-Si(Et)Si/Pba for glycoprotein adsorption/ desorption. Protein solution: 100 mg L^{-1}, 1.0 mL, PW_{12}@TiO_2-Si(Et)Si/Pba hybrid: 0.5 mg; adsorption time: 30 min; NaCl: 1.0 mol L^{-1}; pH: 9.0.

Table S1. Low abundance proteins in liquid supernatant after treating with PW_{12}@TiO_2-(Et)Si(Et)/Pba hybrid

NO.	Protein Name	UniProt ID	Abundance %
1*	Kinesin-like protein KIF18A	Q8NI77	0.00609
2	Immunoglobulin lambda-like polypeptide 1	Q1RMN8	0.0505
3*	HUMAN T-box transcription factor TBX1	Q152R5	0.00436
4*	HUMAN cDNA, FLJ95014	B2RAN2	0.015
5	Ig kappa chain V-I region Roy	P01608	0.139
6	Ig kappa chain V-I region Scw	P01609	0.0111
7	Ig kappa chain V-III region NG9	P01621	0.47
8*	Ig kappa chain V-III region Ti	P01622	0.0107
9	Ig lambda chain V-II region MGC	P01709	0.0092
10*	Ig lambda chain V-II region VIL	P01711	0.0149
11*	Ig lambda chain V-VI region AR	P01721	0.00458
12*	Polymeric immunoglobulin receptor	P01833	0.00052
13	HUMAN Ig kappa chain V-I region BAN	P04430	0.0103
14*	HUMAN Protein S100-A8	P05109	0.00266
15	HUMAN Ig kappa chain V-III region IARC/BL41	P06311	0.0011
16*	HUMAN Protein S100	P06702	0.00573
17*	HUMAN LAMP1 protein variant	Q59FZ0	0.00152
18*	HUMAN cDNA FLJ52540	B7Z2R9	0.00843
19	IGLL1_HUMAN Immunoglobulin lambda-like polypeptide 1	P15814	0.00152
20*	HUMAN Ig kappa chain V-III region HAH	P18135	0.00386
21*	HUMAN ATP synthase subunit alpha, mitochondrial	P25705	0.00102
22*	HUMAN Protein S100-A7	P31151	0.0114
23	HUMAN Ig heavy chain V-III region GAR	P80419	0.00143
24	HUMAN Dermcidin	P81605	0.00191
25*	HUMAN cDNA FLJ55135	B4DQ98	0.00319
26*	HUMAN HCG1814231	Q9Y628	0.013

27*	HUMAN ADP-ribosyl cyclase/cyclic ADP-ribose hydrolase	Q10588	0.00462
28*	HUMAN Uncharacterized protein C19orf68	Q86XI8	0.123
29*	HUMAN Testis-expressed sequence 2 protein	J3KRY2	0.00138
30*	HUMAN Calcium-independent phospholipase A2-gamma	A0A0C4DG51	0.00817
31*	HUMAN Deleted in malignant brain tumors 1 protein	Q9UGM3	0.000881
32	HUMAN Ig heavy chain variable region	A0A068LKQ4	0.0122
33*	HUMAN Ig heavy chain variable region	A0A068LKR4	0.00317
34*	HUMAN Ig heavy chain variable region	A0A068LRV5	0.00301
35	Ig heavy chain variable region	A0A068LRW4	0.0963
36*	HUMAN V3-3 protein	Q5NV83	0.013
37*	HUMAN V1-7 protein	Q5NV89	0.0138
38*	HUMAN V2-13 protein	Q5NV73	0.00346
39*	HUMAN V1-5 protein	Q5NV65	0.0323
40*	HUMAN Protein IGKV2D-30	A0A075B6S6	0.00216
41*	HUMAN Protein IGKV3D-7	A0A0G2JMV0	0.00289
42*	HUMAN MS-D2 light chain variable region	A0A0X9USL5	0.00198
43*	HUMAN MS-A2 light chain variable region	A0A0X9V98	0.00533
44*	HUMAN MS-A1 heavy chain variable region	A0A109PS32	0.00137
45*	HUMAN IGHV3-7 protein	A0A0F7TD49	0.00172
46*	HUMAN GCT-A8 light chain variable region	A0A109PS54	0.01
47*	HUMAN GCT-A2 light chain variable region	A0A109PW41	0.00126
48*	HUMAN IBM-B3 light chain variable region	A0A109PW74	0.00242
49*	HUMAN MS-A3 light chain variable region	A0A120HF56	0.00606
50*	HUMAN MS-C3 light chain variable region	A0A125U0U8	0.00175
51	HUMAN Rheumatoid factor G9 light chain	A0N5G3	0.00217
52*	HUMAN HRV Fab N27-VL	A2IPI2	0.001
53*	HUMAN HRV Fab 026-VL	A2IPI5	0.00278
54	HUMAN Rheumatoid factor RF-ET7	A2J1M4	0.00210
55	HUMAN Rheumatoid factor RF-IP24	A2J1N4	0.00558

56*	HUMAN Rheumatoid factor RF-ET12	A2J1N9	0.00310
57*	HUMAN UGa8H	A2KUC3	0.00141
58	HUMAN Vh1-D-J3-region	A2N011	0.00477
59*	HUMAN VH6DJ protein	A2N0U0	0.0054
60	HUMAN VH6DJ protein	A2N0U4	0.00485
61*	HUMAN VK3 protein	A2N2F4	0.001
62*	HUMAN Cold agglutinin FS-2 L-chain	A2NB46	0.0014
63*	HUMAN VH87-2 protein	A2N2G5	0.00363
64*	HUMAN Kappa light chain variable region	A2NJV5	0.00344
65*	HUMAN Precursor (AA -19 to 113)	A2NV55	0.006
66*	HUMAN Anti-folate binding protein	A2NYQ9	0.00883
67	HUMAN Heavy chain Fab	A2NYU7	0.0188
68	HUMAN Heavy chain Fab	A2NYU8	0.00890
69*	HUMAN Uncharacterized protein	B7ZMG8	0.00181
70	HUMAN Keratin 1	H6VRG2	0.00850
71*	HUMAN GRB2-related adapter protein	I3L2P9	0.00128
72*	HUMAN Immunglobulin heavy chain variable region	Q0ZCH1	0.00156
73*	HUMAN Myosin-reactive immunoglo	Q9UL91	0.0267
74	HUMAN CDNA FLJ26301 fis	Q6ZP85	0.0108
75	HUMAN Uncharacterized protein	Q569I7	0.00960
76*	HUMAN Uncharacterized protein	Q6P5S3	0.0111
77*	HUMAN Putative uncharacterized protein DKFZp686C02218	Q7Z374	0.00313
78	HUMAN Uncharacterized protein	Q7Z2U7	0.00287
79*	HUMAN IgG L chain	S6BAR0	0.0171
80*	HUMAN Uncharacterized protein	Q7Z3Y4	0.00556
81	HUMAN Uncharacterized protein	Q8TCD0	0.000747
82	HUMAN Putative matrix cell adhesion molecule-3	Q96QS0	0.00361
83	HUMAN Anti-streptococcal/anti-myosin immunoglobulin lambda light chain variable region	Q96SB0	0.0460

84	HUMAN IgG L	S6B294	0.00138
85	HUMAN IgG H chain	S6B2A6	0.00986