Table S2. Statistical factor analysis for major and trace elements of ferromanganese crusts

	Factor1	Factor2	Factor3	Factor4
	35.50%	23.00%	18.50%	12.60%
Mn	0.257	0.446	0.681	0.425
Fe	0.013	0.516	0.162	0.819
Al	-0.501	-0.256	-0.466	-0.143
Si	-0.364	-0.282	-0.837	0.221
Ca	0.206	0.587	0.693	0.065
P	-0.108	-0.391	-0.352	-0.803
Mg	-0.608	0.221	-0.013	0.439
K	-0.510	0.142	-0.034	0.289
Na	0.211	-0.240	0.121	0.440
Ti	-0.259	0.761	0.045	-0.172
Li	-0.586	0.387	-0.592	0.109
Be	0.357	0.339	-0.161	-0.599
Sc	0.014	-0.157	-0.628	-0.729
V	0.786	-0.150	0.158	-0.506
Co	0.178	-0.156	0.823	0.455
Ni	-0.268	0.628	0.402	0.478
Cu	-0.515	0.823	-0.017	0.108
Zn	0.151	0.944	-0.150	-0.061
Ga	0.292	0.793	-0.093	0.459
Rb	-0.092	0.130	-0.872	-0.321
Sr	0.914	-0.015	0.264	-0.275
Zr	0.500	0.830	-0.165	-0.154
Nb	-0.010	0.924	-0.139	0.133
Mo	0.628	-0.261	0.632	-0.325
Cd	0.314	0.628	0.479	0.495
Cs	-0.230	0.260	-0.865	-0.173
Ba	0.426	0.848	0.082	-0.263
Hf	-0.023	0.950	-0.244	0.158
Ta	-0.205	0.930	0.109	0.160
W	0.514	0.292	0.772	0.096
Tl	-0.427	-0.341	-0.367	-0.735
Pb	0.295	-0.138	0.725	0.468
Bi	0.281	0.764	0.436	0.324
Th	0.633	-0.544	0.017	0.398
U	0.539	-0.142	0.788	0.083
La	0.749	0.008	0.530	0.192
Ce	0.142	0.768	0.507	0.259
Pr	0.984	-0.028	0.125	0.042
Nd	0.981	-0.020	0.159	0.062
Sm	0.976	-0.048	0.169	0.048

Eu	0.929	0.040	0.319	0.066
Gd	0.970	0.085	0.179	0.079
Tb	0.970	-0.018	0.188	0.136
Dy	0.969	-0.009	0.217	0.096
Y	0.800	0.367	-0.028	-0.409
Ho	0.948	0.097	0.276	0.117
Er	0.912	0.200	0.267	0.229
Tm	0.877	0.238	0.279	0.306
Yb	0.916	0.247	0.211	0.227
Lu	0.797	0.380	0.267	0.367