

Supplementary Information

High-sensitivity detection of low-concentration heavy metal ions in solution by multiple reflection enhanced absorption (MREA) spectroscopy

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Fig. S1 Irradiance of different reflective surfaces during multiple reflections under the same incident light spot condition.

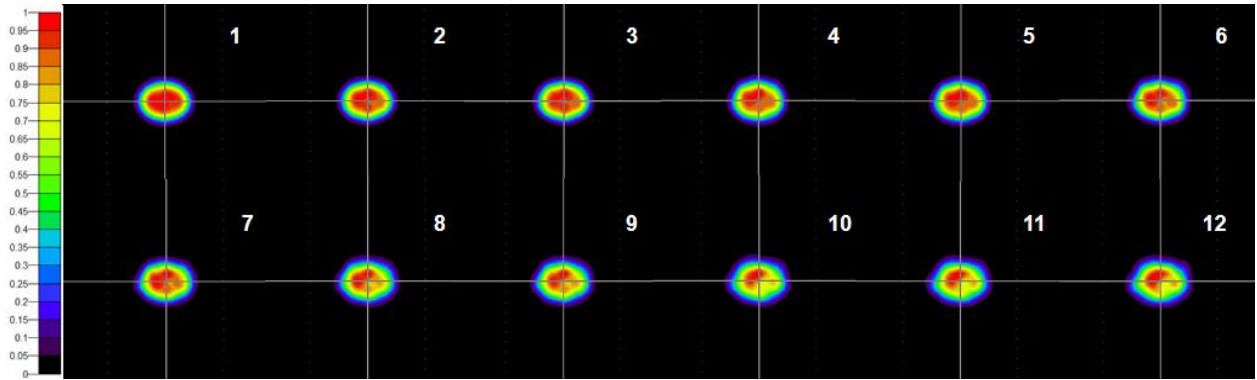


Fig. S2 Repeatability of absorbance measurement at different wavelengths under different

light spot conditions (A_R): (A) Traditional absorption; (B) MREA.

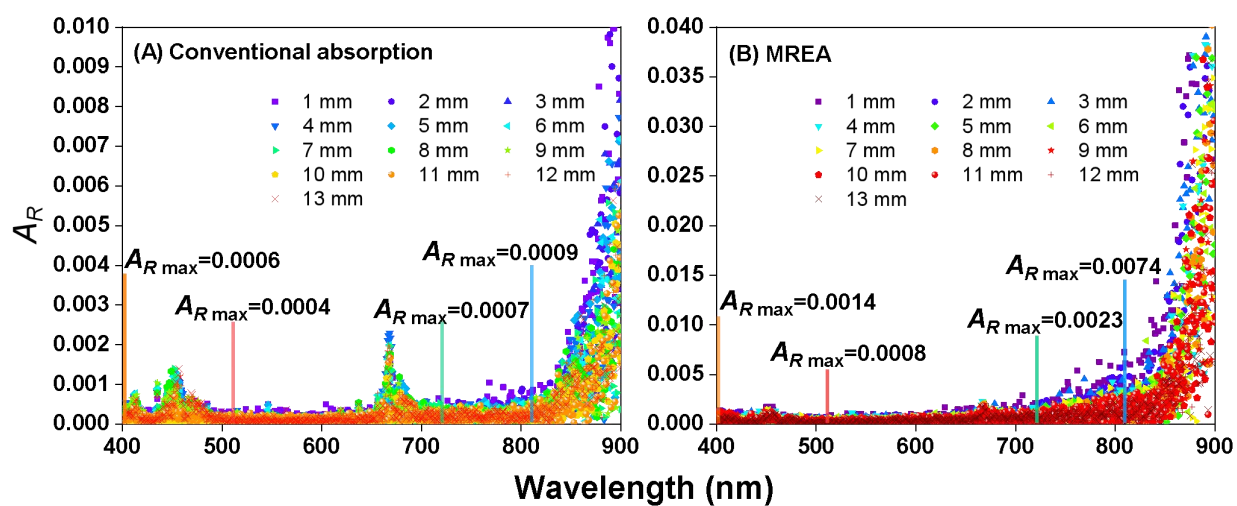


Table S1 Relative spectral bandwidth (RBW) of different substances under different spectralbandwidth conditions.

Chemicals	0.4 nm	0.5 nm	0.6 nm	0.7 nm	0.8 nm	0.9 nm	1.0 nm
Cr ⁶⁺	0.00318	0.00420	0.00502	0.00597	0.00689	0.00744	0.00813
Co ²⁺	0.00373	0.00447	0.00537	0.00633	0.00747	0.00833	0.00892
Ni ²⁺	0.00228	0.00298	0.00335	0.00387	0.00456	0.0520	0.00598
Cu ²⁺	0.00170	0.00201	0.00252	0.00289	0.00340	0.00405	0.00457

Chemicals	1.1 nm	1.2 nm	1.3 nm	1.4 nm	1.5 nm	1.6 nm	1.7 nm
Cr ⁶⁺	0.00875	0.00954	0.01032	0.01124	0.01290	0.01367	0.01402
Co ²⁺	0.00941	0.01120	0.01176	0.01294	0.01365	0.01494	0.01560
Ni ²⁺	0.00628	0.00683	0.00739	0.00804	0.00857	0.00911	0.00989
Cu ²⁺	0.00482	0.00510	0.00534	0.00572	0.00639	0.00680	0.00724

Chemicals	1.8 nm	1.9 nm	2.0 nm	2.1 nm	2.2 nm	2.3 nm	2.4 nm
Cr ⁶⁺	0.01489	0.01521	0.01590	0.01667	0.01740	0.01801	0.01908
Co ²⁺	0.01672	0.01781	0.01867	0.01994	0.02067	0.02138	0.02241
Ni ²⁺	0.01024	0.01082	0.01139	0.01187	0.01271	0.01309	0.01367
Cu ²⁺	0.00771	0.00800	0.00850	0.00892	0.00943	0.00978	0.01020

Chemicals	2.5 nm	2.6 nm	2.7 nm	2.8 nm	2.9 nm	3.0 nm
Cr ⁶⁺	0.02105	0.02227	0.02405	0.02567	0.02690	0.02780
Co ²⁺	0.02388	0.02447	0.02520	0.02634	0.02717	0.02801
Ni ²⁺	0.01402	0.01458	0.01542	0.01609	0.01658	0.01708
Cu ²⁺	0.01073	0.01110	0.01162	0.01203	0.01239	0.01276

Table S2 The relationship between relative spectral bandwidth (*RBW*) and absorbance measurement error (A_E).

<i>RBW</i>	A_E	<i>RBW</i>	A_E	<i>RBW</i>	A_E
0.01	0.0005	0.06	0.0017	0.2	0.0181
0.02	0.0005	0.07	0.0023	0.3	0.0396
0.03	0.0005	0.08	0.003	0.4	0.0679
0.04	0.0008	0.09	0.0038	0.5	0.1013
0.05	0.0012	0.1	0.0046		