Electronic Supplementary Material (ESI) for Environmental Science: Nano.

Supplementary Materials

Colloidal Stability and Deposition Behavior of Chromium (Hydr)oxide In the Presence of Dissolved Organic Matter: Role of Coprecipitation and Adsorption

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Table S1. Properties of SLOM. C1-C4 represented the components in EEM spectrum.

DOC (mg L^{-1})	$SUVA_{254}$	C1 (%)	C2 (%)	C3 (%)	C4 (%)	Zeta Potential (mV)	r_D (Hz s^{-1})
24.1±1.6	12.6±0.9	45.8	32.9	20.3	1.1	-45.6	0.023

Table S2. Surface elemental composition of Cr (hydr)oxides in the presence of SLOM detected using XPS under different reaction time.

	Cr_2O_3				Cr_2CuO_4				$Cr(OH)_3$		
	1 hour	2 hours	3 hours		1 hour	2 hours	3 hours		1 hour	2 hours	3 hours
C 1s	26.32	31.34	24.21	C 1s	60.15	50.46	51.2	C 1s	28.43	32.35	20.57
Cr 2p	23.19	18.21	18.69	Cr 2p	6.73	6.04	2.68	Cr 2p	8.96	8.0	2.25
O 1s	49.73	49.11	56.18	Cu 2p	6.55	6.25	2.77	O 1s	61.17	57.45	76.05
N 1s	0.76	1.35	0.92	O 1s	25.82	35.71	42.4	N 1s	1.44	2.21	1.13
				N 1s	0.75	1.54	0.95				
TOCC/Cr*	**1.13**	**1.72**	**1.29**		**4.52**	**4.11**	**9.39**		**3.17**	**4.04**	**9.14**

* Denominator referred to the Cr atomic content for Cr_2O_3 and $Cr(OH)_3$, but referred to the sum of Cr and Cu atomic content for Cr_2CuO_4.

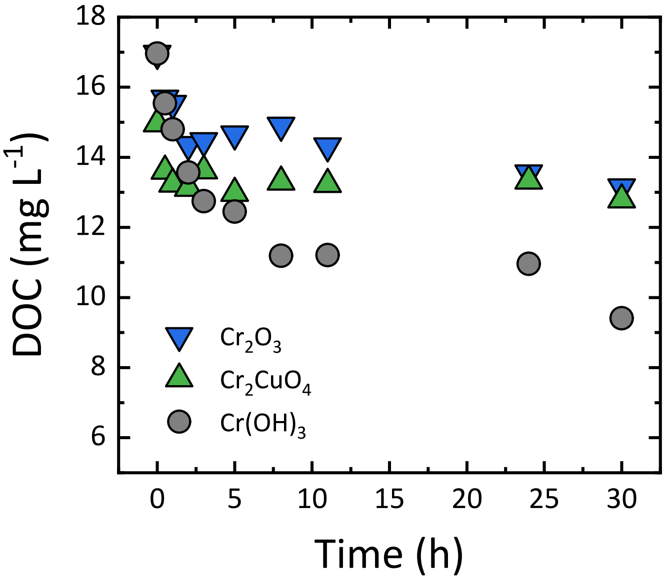

Fig. S1. The dynamic changes in DOC of aqueous SLOM in the presence of different Cr (hydr)oxides.

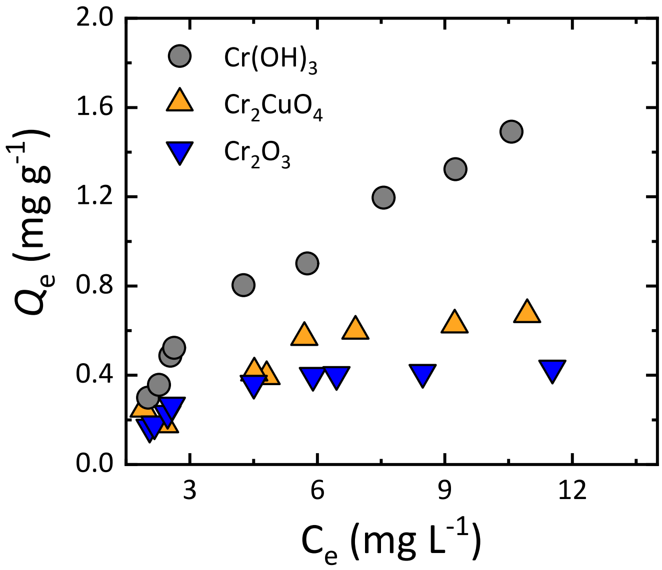

Fig. S2. Adsorption isotherms of TOC of SLOM on the different Cr (hydr)oxides.

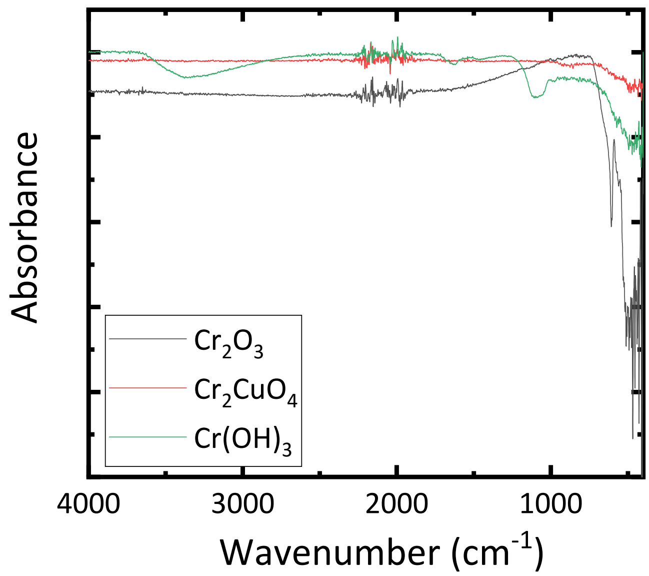

Fig. S3. FTIR spectrum of $Cr(OH)_3$, Cr_2CuO_4, and Cr_2O_3 samples.

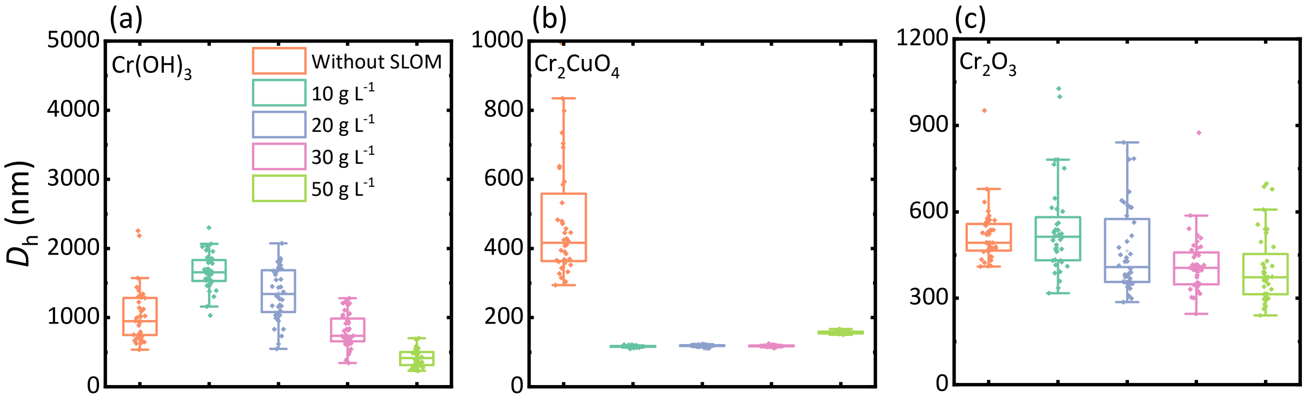

Fig. S4 Box plots of hydrodynamic diameter (D_h) of (a) $Cr(OH)_3$, (b) Cr_2CuO_4, and (c) Cr_2O_3 under different SLOM loadings.

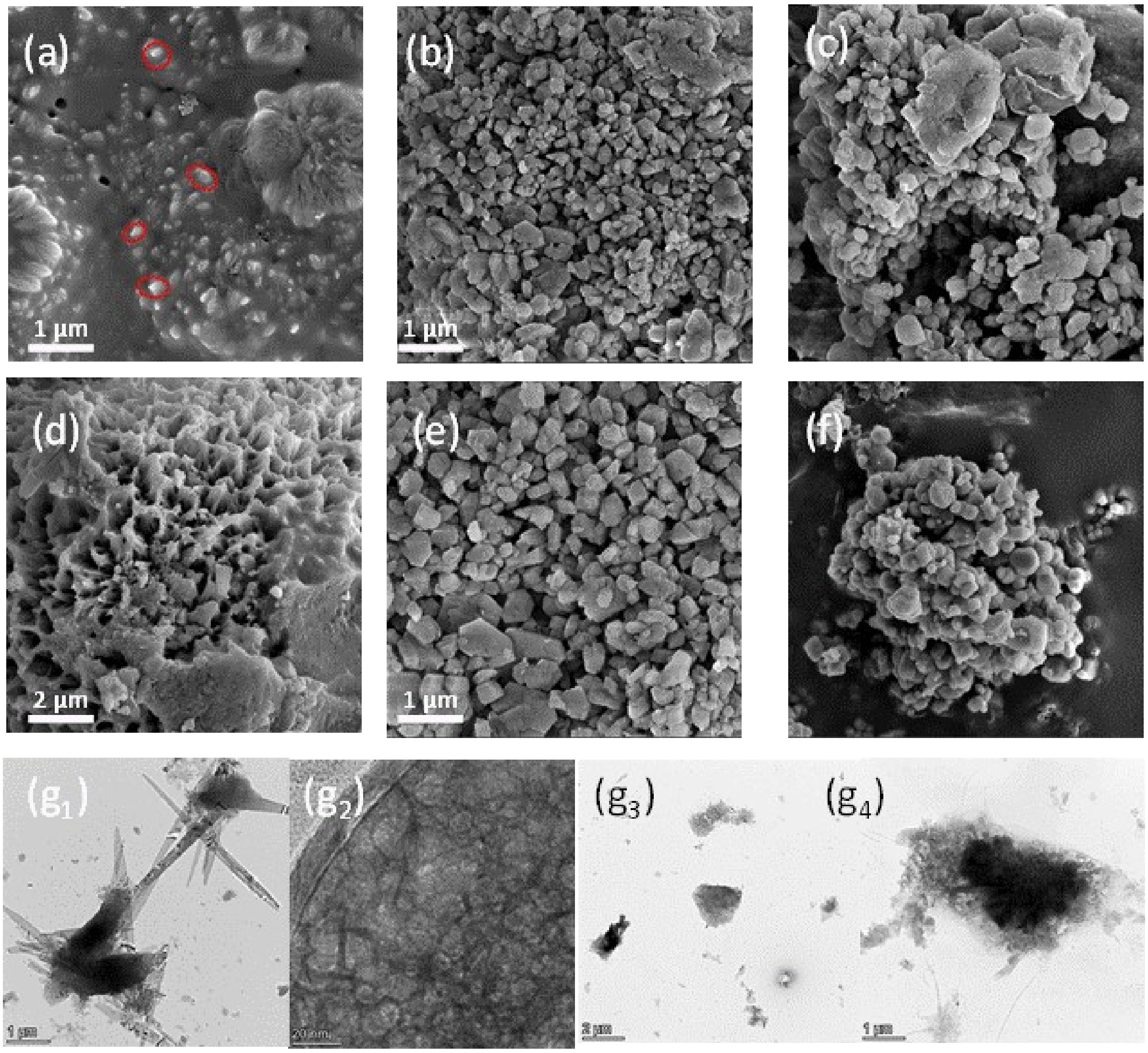

Fig. S5 SEM images of different Cr (hydr)oxide colloids in the presence of SLOM. (a) and (d) referred to $Cr(OH)_3$, (b) and (e) referred to Cr_2CuO_4, and (c) and (f) referred to Cr_2O_3. The TEM images of (g_1) and (g_2) $Cr(OH)_3$ and (g_3) and (g_4) Cr_2O_3.

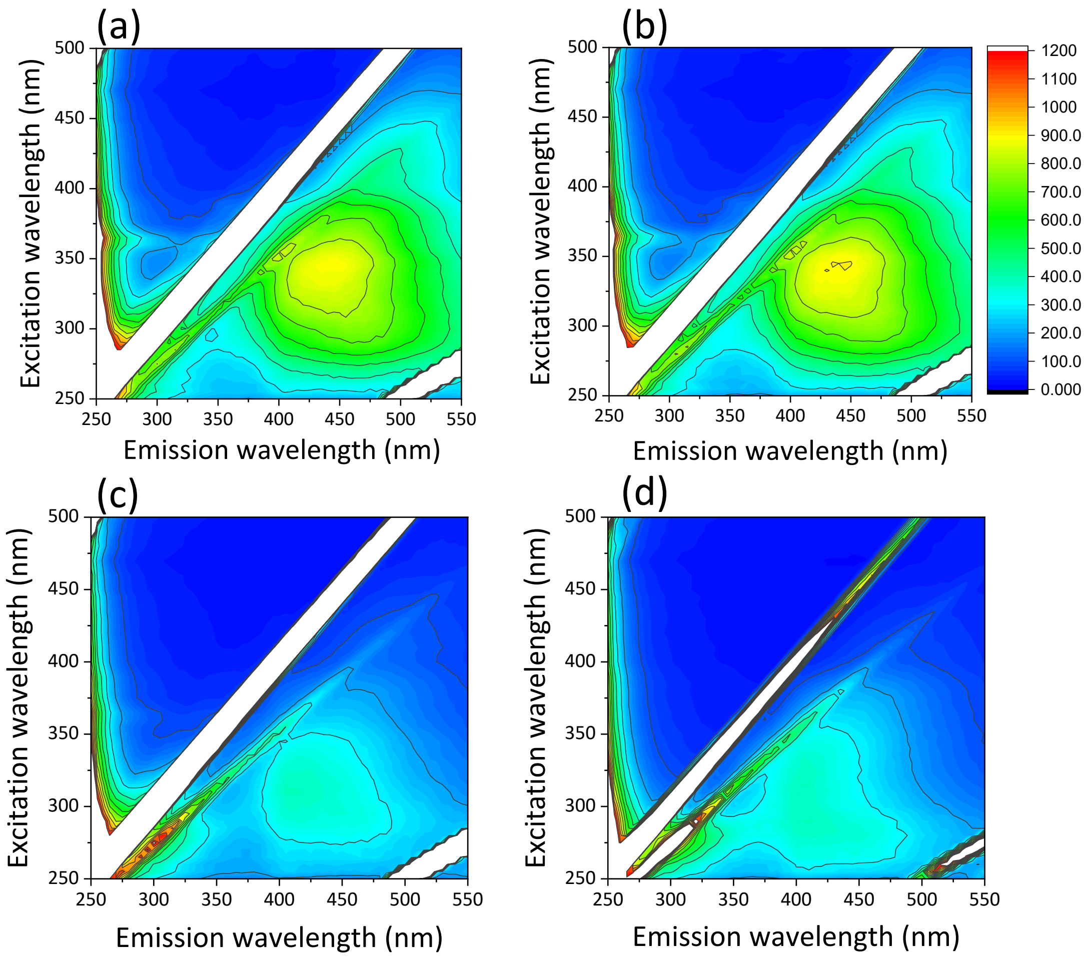

Fig. S6 Changes in EEM spectrum: (a) original SLOM and the SLOM in the presence (b) Cr_2O_3, (c) Cr_2CuO_4, and (d) $Cr(OH)_3$.

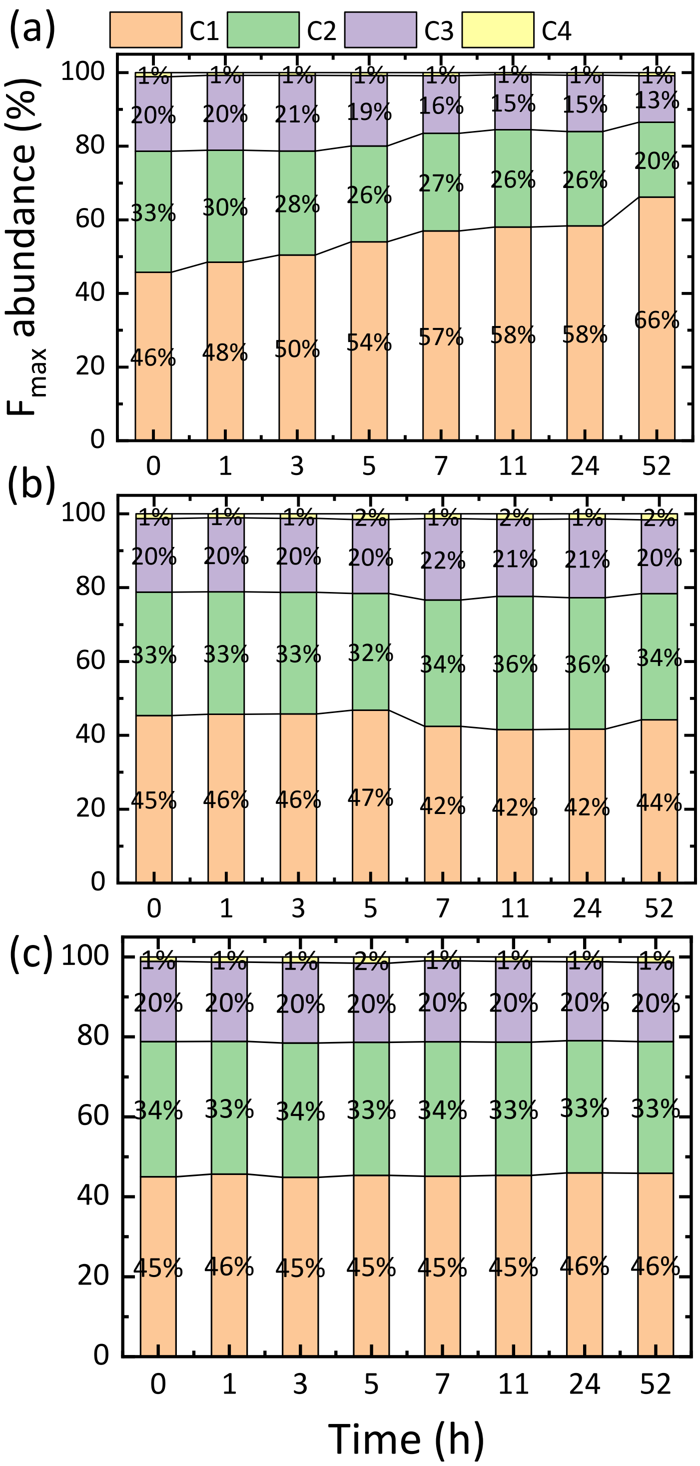

Fig. S7 Changes in F_{max} abundance (%) of four components in SLOM due to interaction with (a) $Cr(OH)_3$, (b) Cr_2CuO_4, and (c) Cr_2O_3. Four components in SLOM were determined by fluorescent loadings in EEM spectra and PARAFAC analysis.

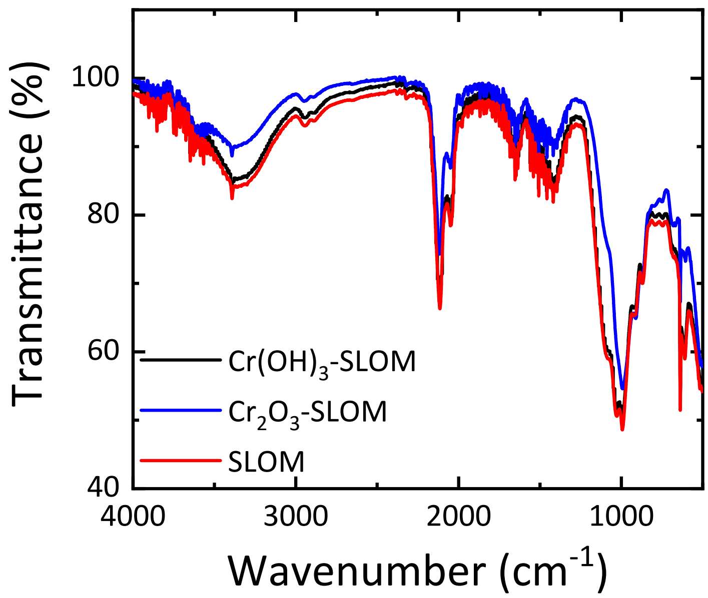

Fig. S8 FTIR spectrum of aqueous SLOM in the presence of different Cr (hydr)oxides.

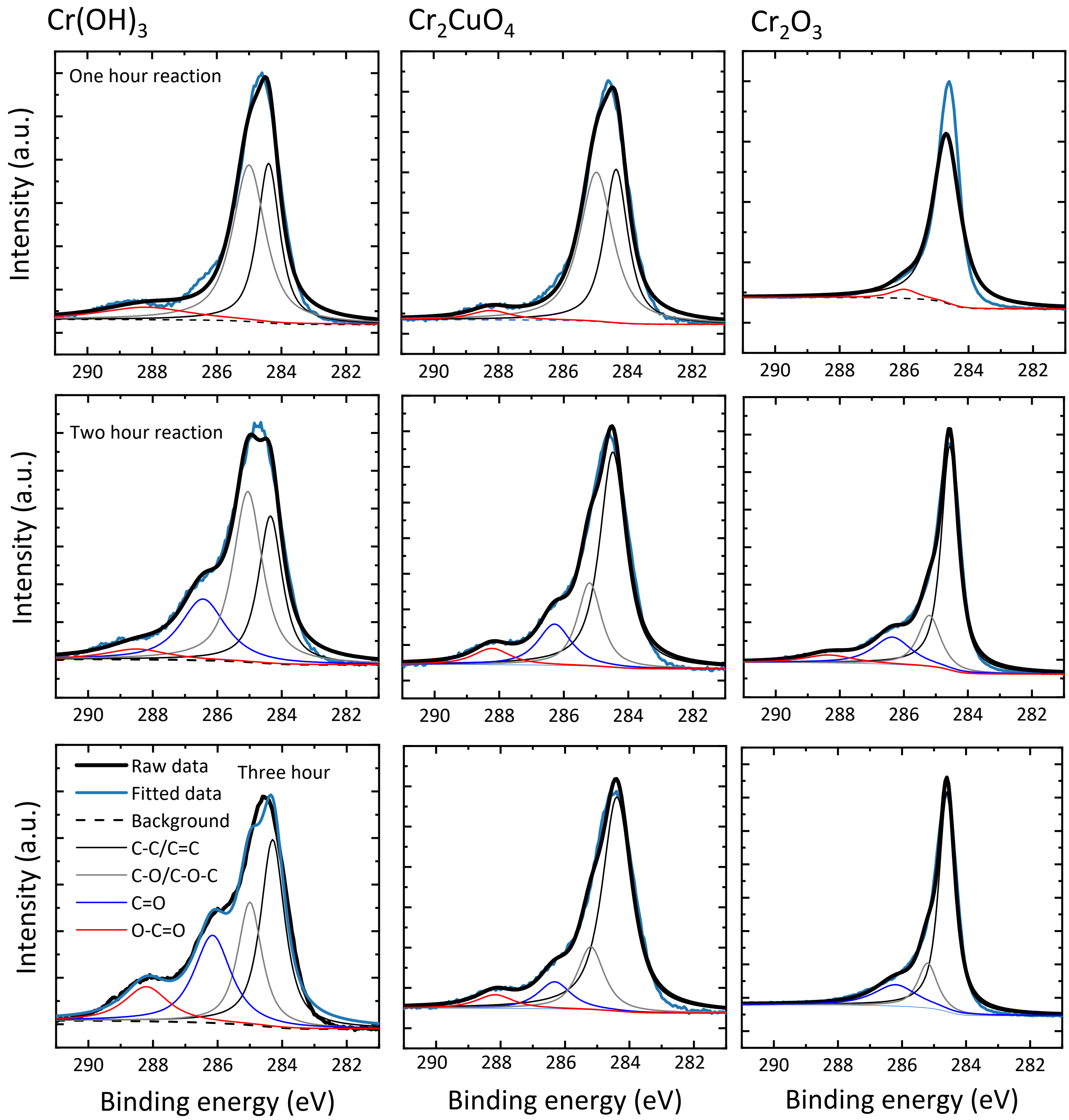

Fig. S9 The deconvoluted peaks of C-C/C=C, C-O/C-O-C, C=O, and O-C=O of different Cr (hydr)oxides in the presence of SLOM using XPS analysis. From upper to downline, the figures referred to the different reaction times. Left column figures referred to $Cr(OH)_3$, middle column figures referred to Cr_2CuO_4, and right column figures referred to Cr_2O_3.

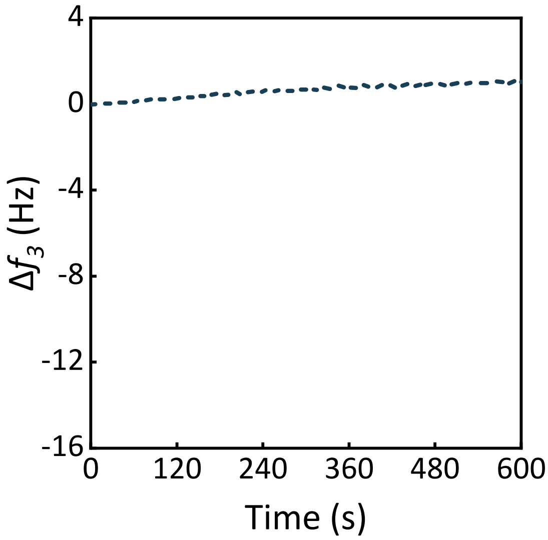

Fig. S10 The changes in the frequency of SLOM alone.

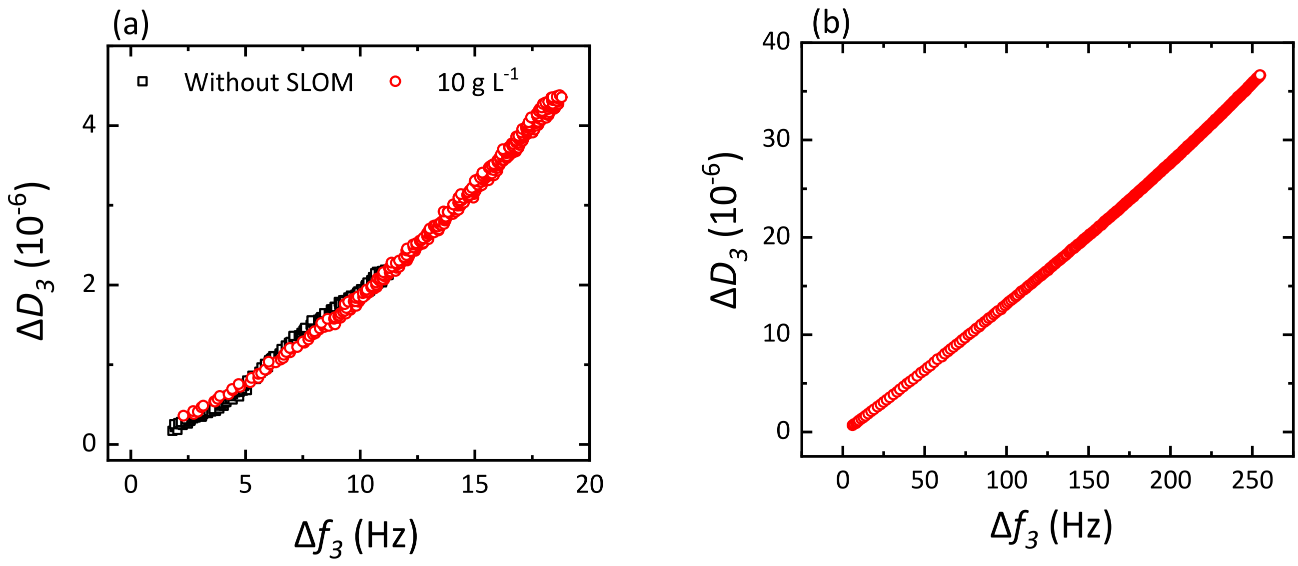

Fig. S11 The changes in the dissipation of $Cr(OH)_3$ colloids as a function of frequency shifts with 0 and 10 g L^{-1} loading SLOM (a) and under highest SLOM loading (b).