Supporting Information

Highly efficient degradation of dye pollutants by Ce-doped MoO_3 catalyst at room temperature

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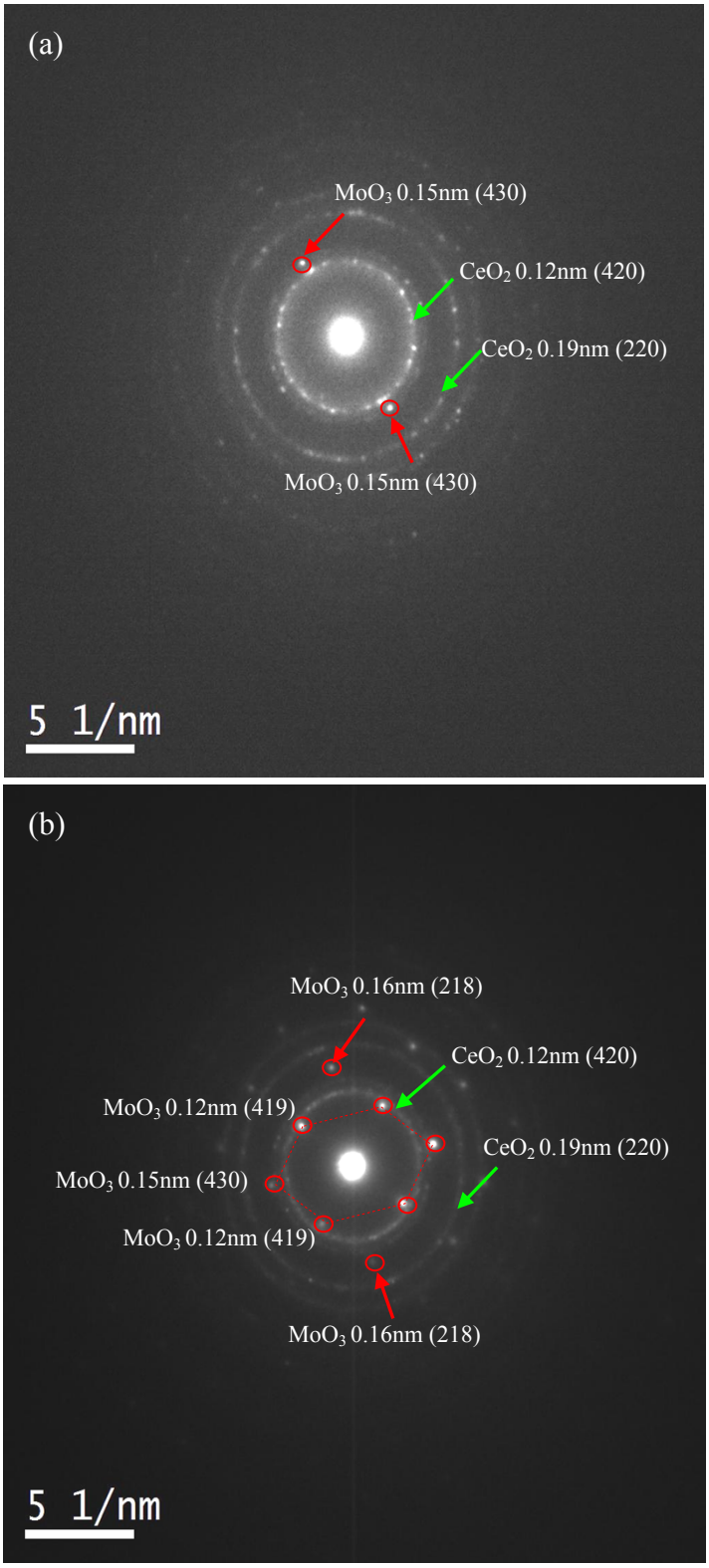


Figure S1. Selected area electron diffraction (SAED) patterns of the typical Ce(*x*)/MoO_3 samples: (a) x=5; (b) x=40

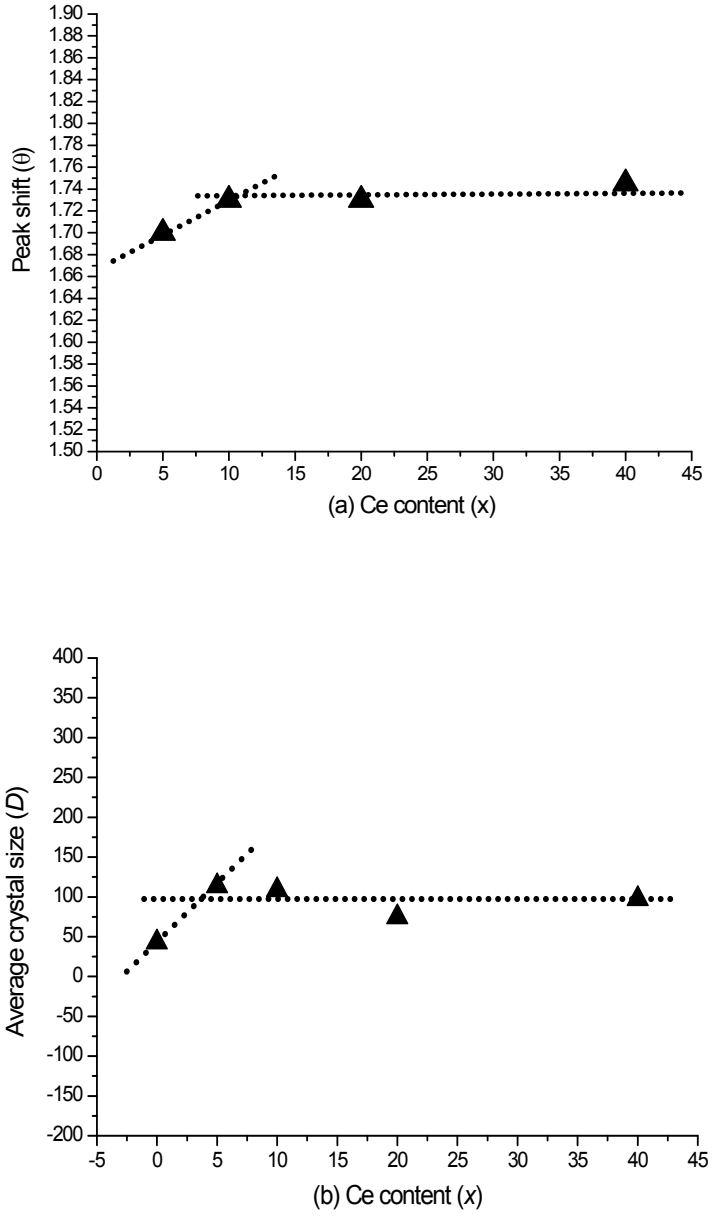


Figure S2. Peak shift degrees (θ) and average crystal sizes with the increase of CeO_2 content: calculated by (210) peak at $2\theta=25.79^{o}$

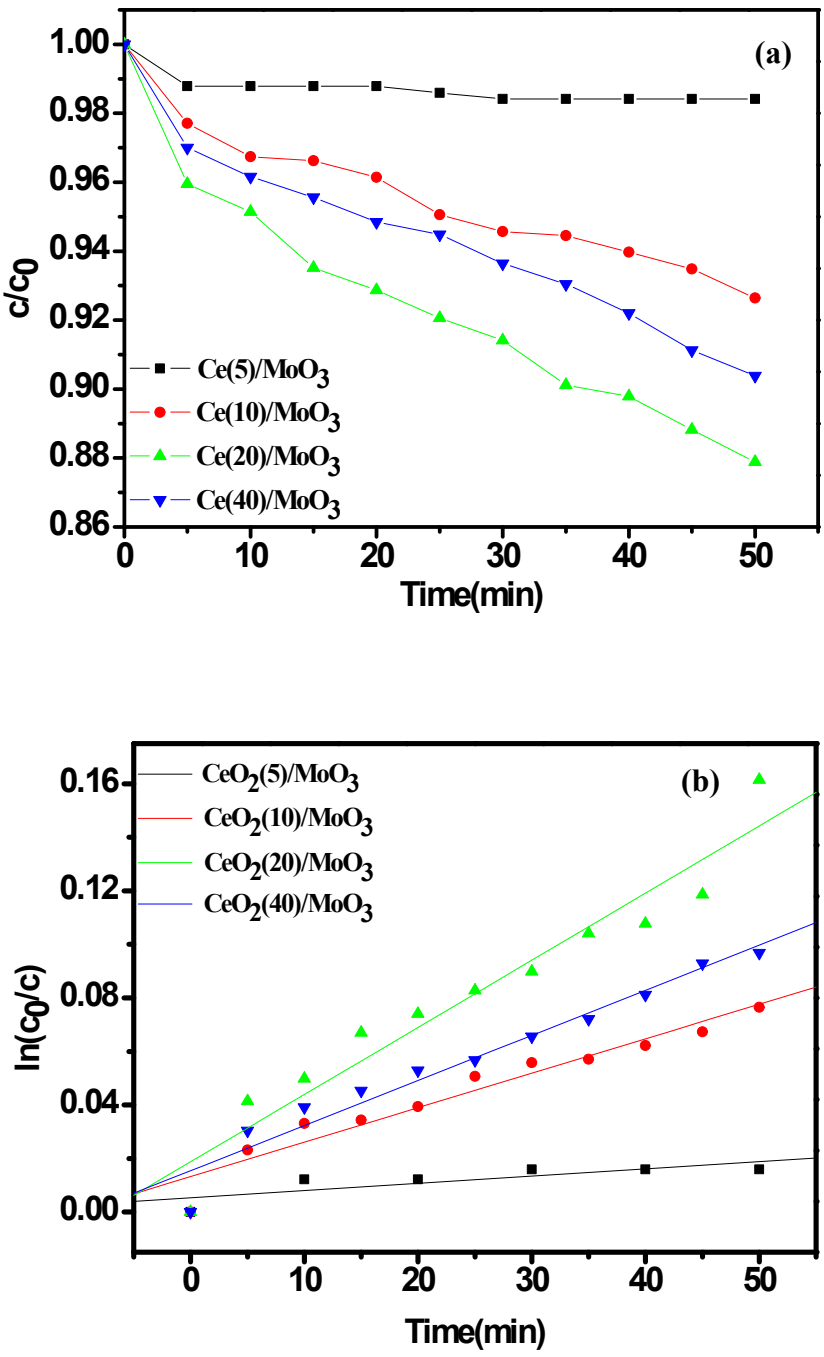


Figure S3. Degradation curves (a) and reaction kinetic curves of MO by Ce(x)/MoO_3 catalysts within 50 min at room temperature and normal atmospheric pressure: 200 mL 15 mgL^{-1} MO aqueous solution

Table S1 Apparent reaction kinetic constants (k_a) for the degradations of MO dye in single MO solution and MB-MO mixture dye solution by Ce(x)/MoO_3 catalysts

Samples	k_a (Single MO solution) (min^{-1})	k_a (MO in MB-MO mixture dyes) (min^{-1})
Ce(5)/MoO_3	2.700×10^{-4}	0.98228×10^{-4}
Ce(10)/MoO_3	1.29×10^{-3}	1.05×10^{-3}
Ce(20)/MoO_3	2.51×10^{-3}	2.33×10^{-3}
Ce(40)/MoO_3	1.68×10^{-3}	1.68×10^{-3}

After reacting for 50 min

The degradation rates follow the order as follows:

Ce(20)/MoO_3 >Ce(40)/MoO_3 > Ce(10)/MoO_3>Ce(5)/MoO_3

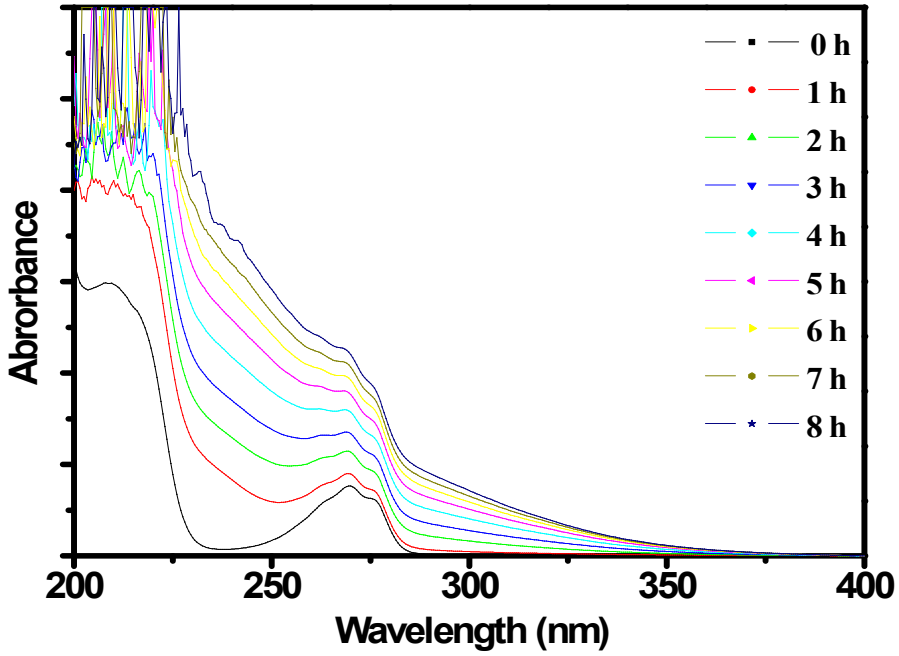


Figure S4. UV-vis absorption spectra of phenol solution over Ce(40)/MoO_3 at different reaction times: 200mL 10 mgL^{-1} phenol in the ethanol-water solution ($V_{ethanol}/V_{water}$=2/5)

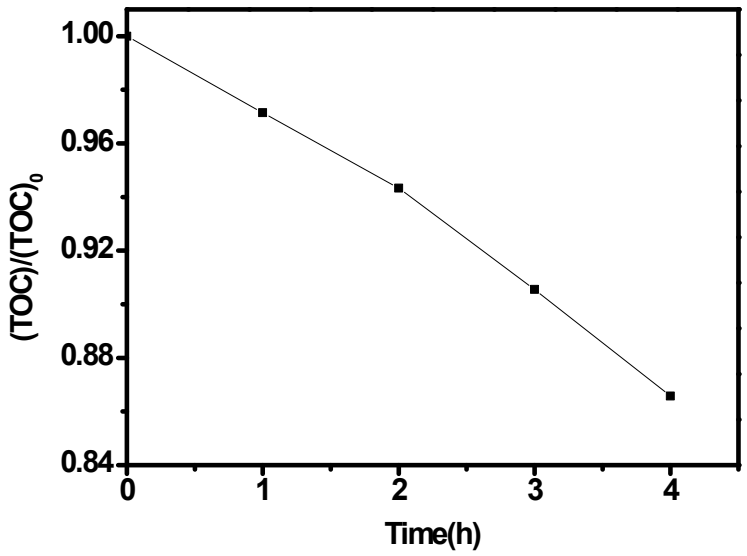


Figure S5. Changes of TOC during the degradation of MB over Ce(5)/MoO_3

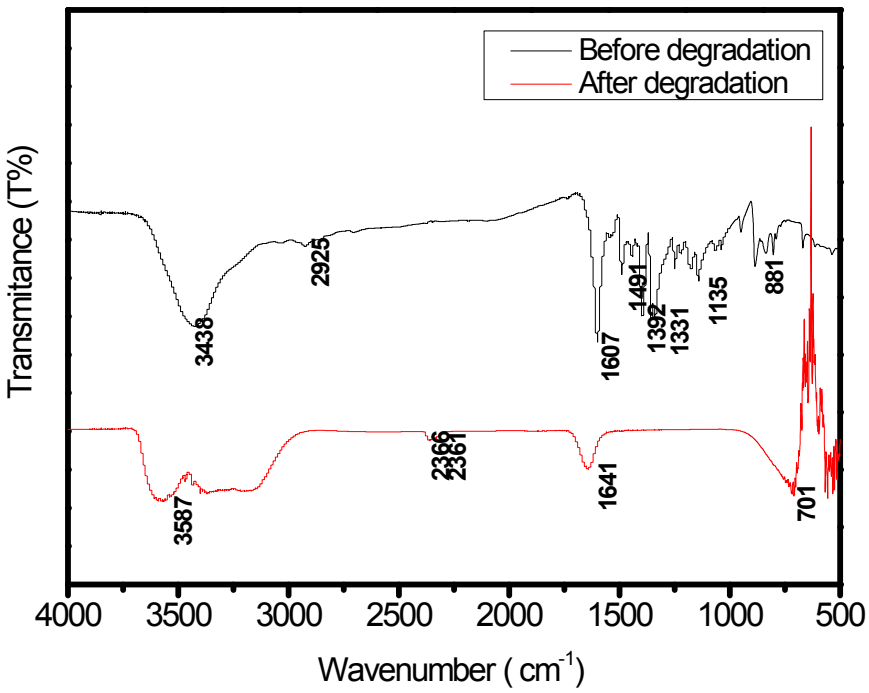


Figure S6. FT-IR spectra of MB before and after degradation

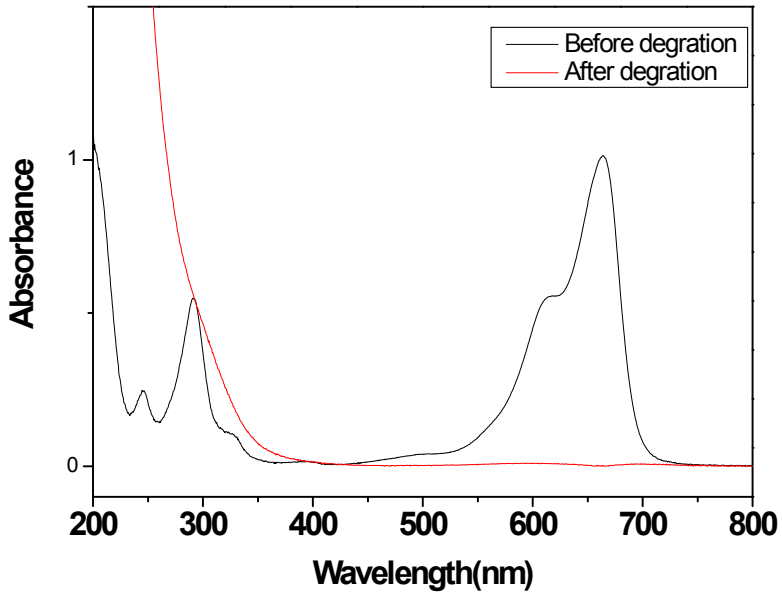
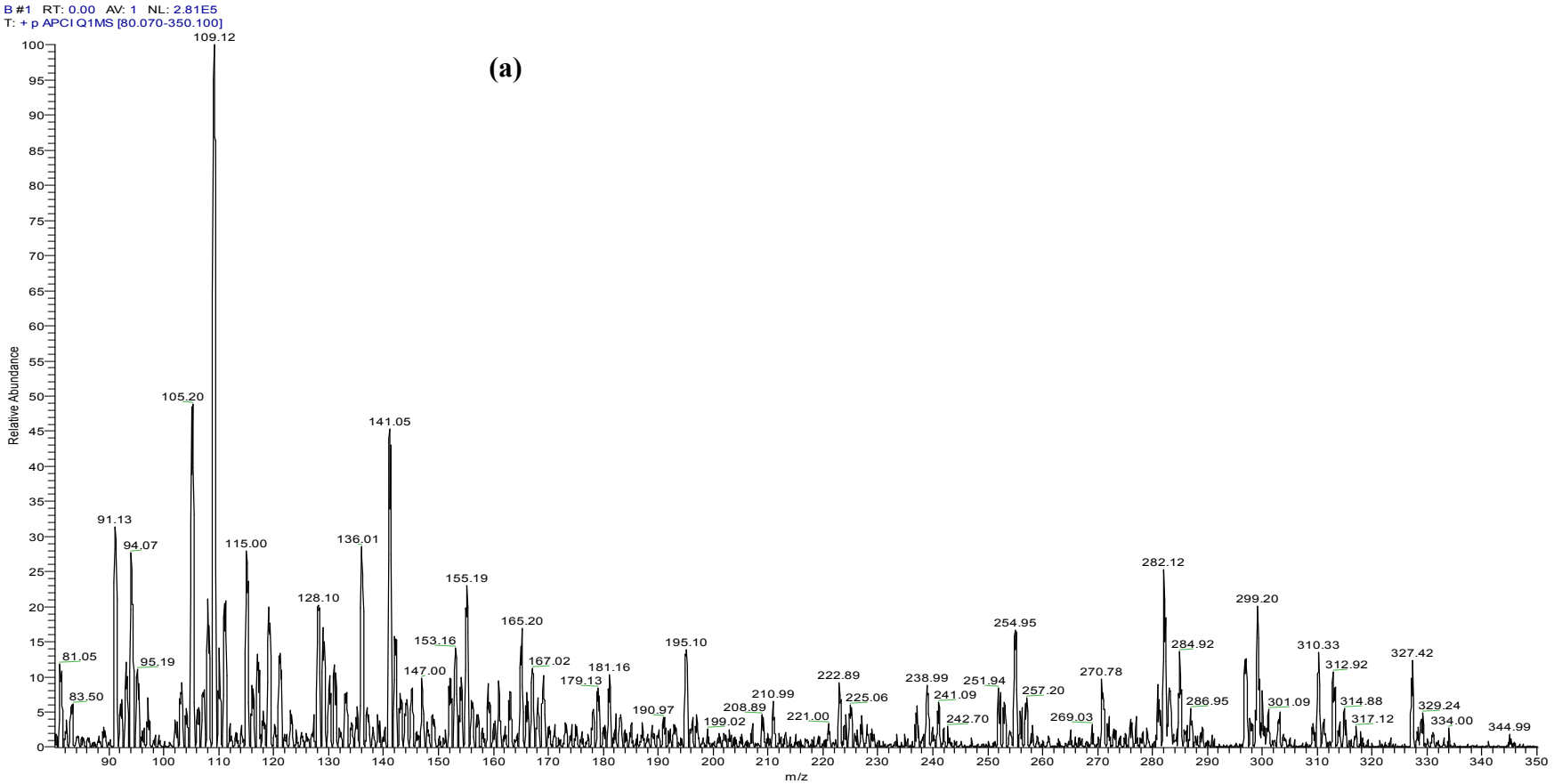
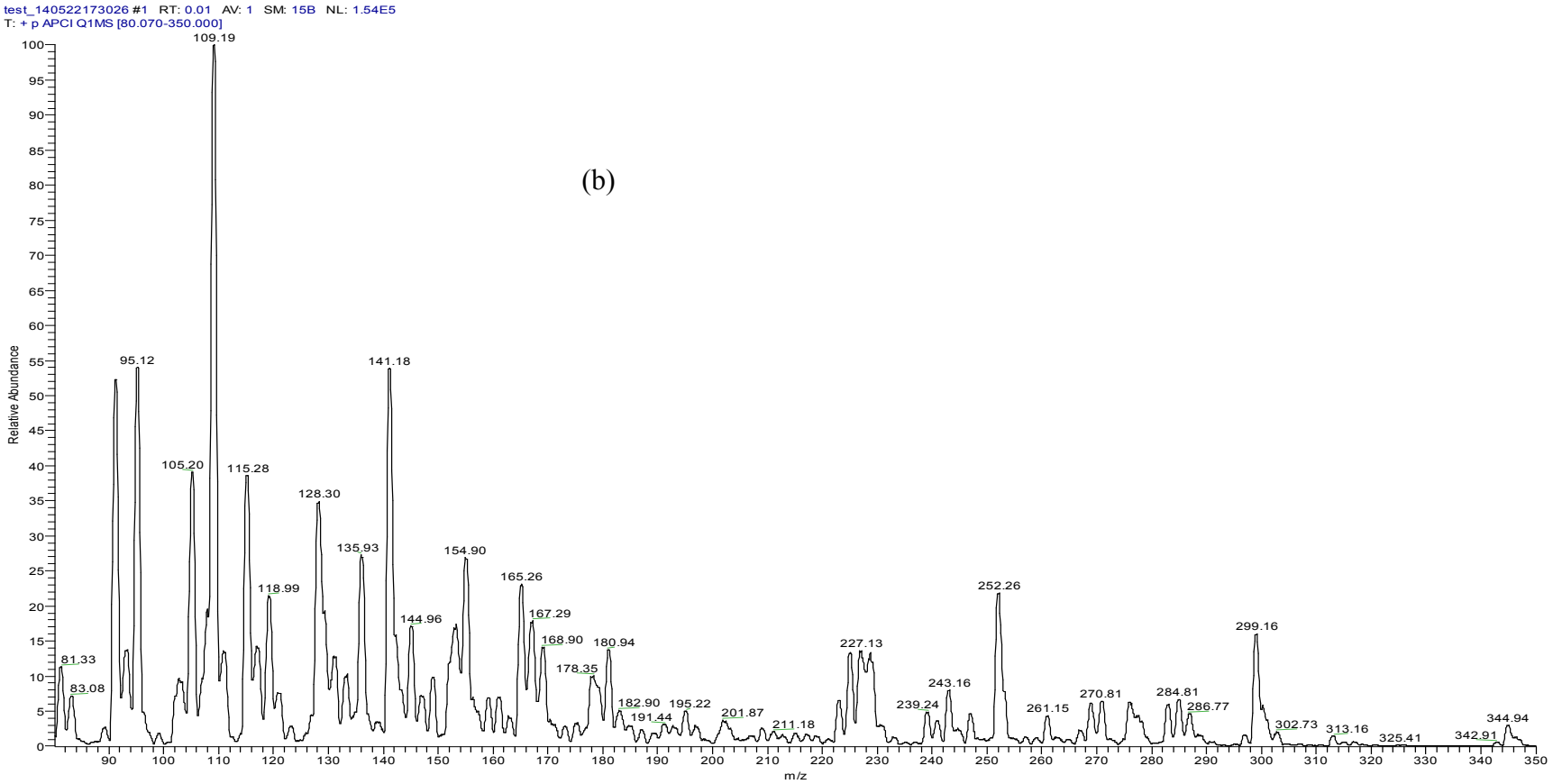


Figure S7. UV–vis absorption spectra of MB solution before and after degradation


B #1 RT: 0.00 AV: 1 NL: 2.81E5
T: + p APCI Q1MS [80.070-350.100]
(a)
Relative Abundance
m/z
109.12
105.20
141.05
91.13
94.07
115.00
136.01
155.19
128.10
165.20
153.16
167.02
147.00
181.16
179.13
195.10
190.97
208.89
210.99
199.02
221.00
222.89
225.06
238.99
241.09
242.70
251.94
254.95
257.20
269.03
270.78
282.12
284.92
286.95
299.20
301.09
310.33
312.92
314.88
317.12
327.42
329.24
334.00
344.99
81.05
83.50
95.19



(b)

Figure S8. Mass spectra (MS) of MB: (a) background; (b) after degradation by Ce(5)/MoO_3)