

Electronic Supplementary Information

**The cascade synthesis of α,β -unsaturated ketones via
oxidative C–C coupling of ketones and primary alcohols
over ceria catalyst**

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Table S1 The coupling reaction of acetophenone with benzyl alcohol or *p*-nitrobenzyl alcohol catalyzed by CeO₂^a

Entry	Primary alcohol (2)	Conv. (%) ^b	Sel. (%)			
			3	4	6	7
1	benzyl alcohol	64	86	5	7	2
2	<i>p</i> -nitrobenzyl alcohol	57	19	-	81	-

^a Reaction conditions: **1** (0.5 mmol), **2** (0.75 mmol), CeO₂, *p*-xylene (2 mL), 150 °C, for 12 h, 1 atm air. ^b The conversions and selectivity based on primary alcohol consumption were determined by GC-MS.

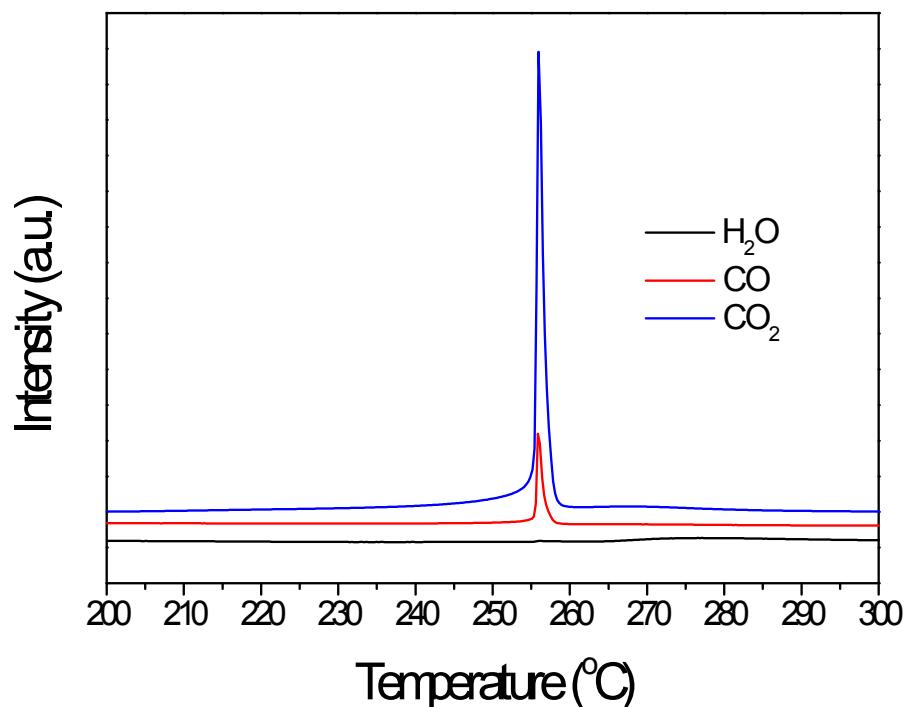


Fig. S1 TPO-MS of the recovered CeO₂.

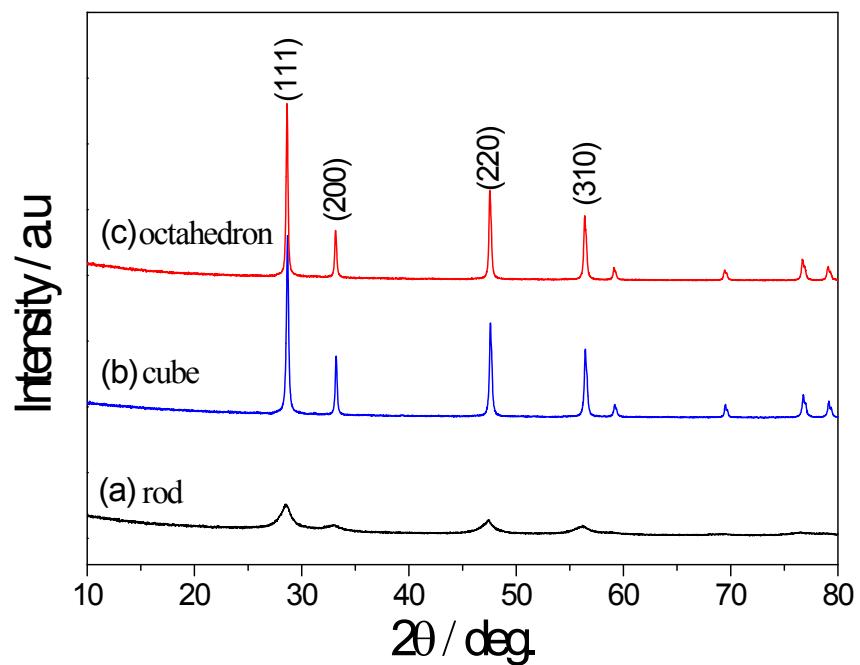


Fig. S2 XRD patterns of (a) CeO₂ nanorods, (b) CeO₂ nanocubes, and (c) CeO₂ nanoctahedrons

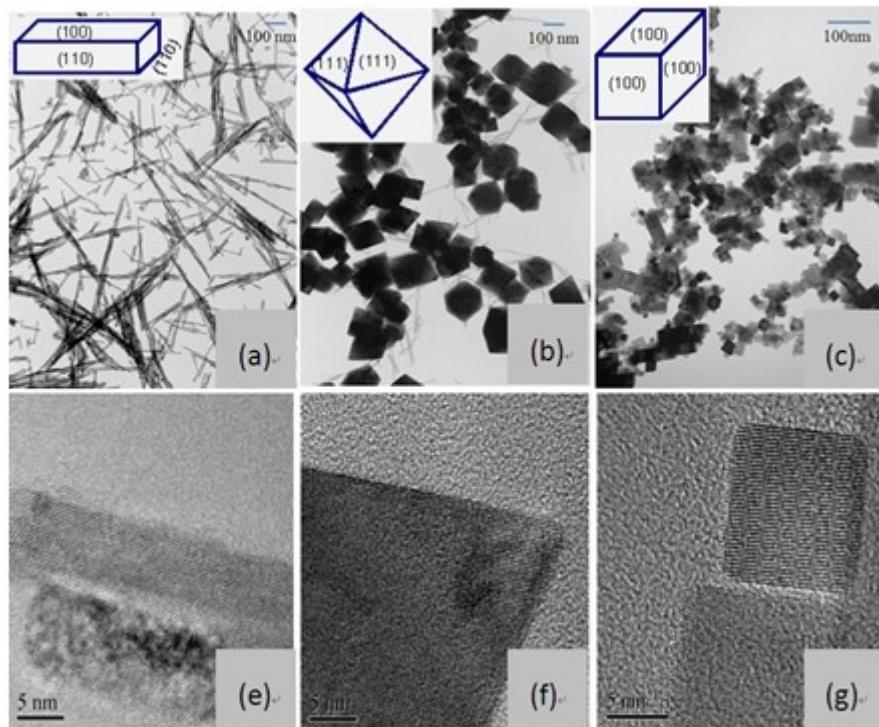


Fig. S3 TEM image (a) and HRTEM (e) images of CeO_2 nanorods, TEM image (b) and HRTEM (f) images of CeO_2 nanoctahedrons, TEM image (c) and HRTEM (g) images of CeO_2 nanocubes

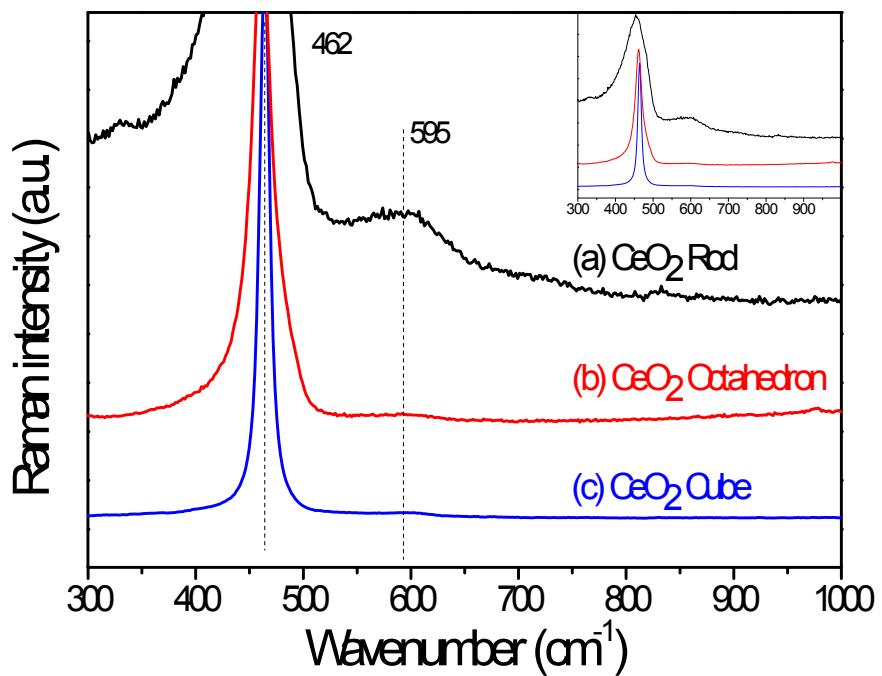
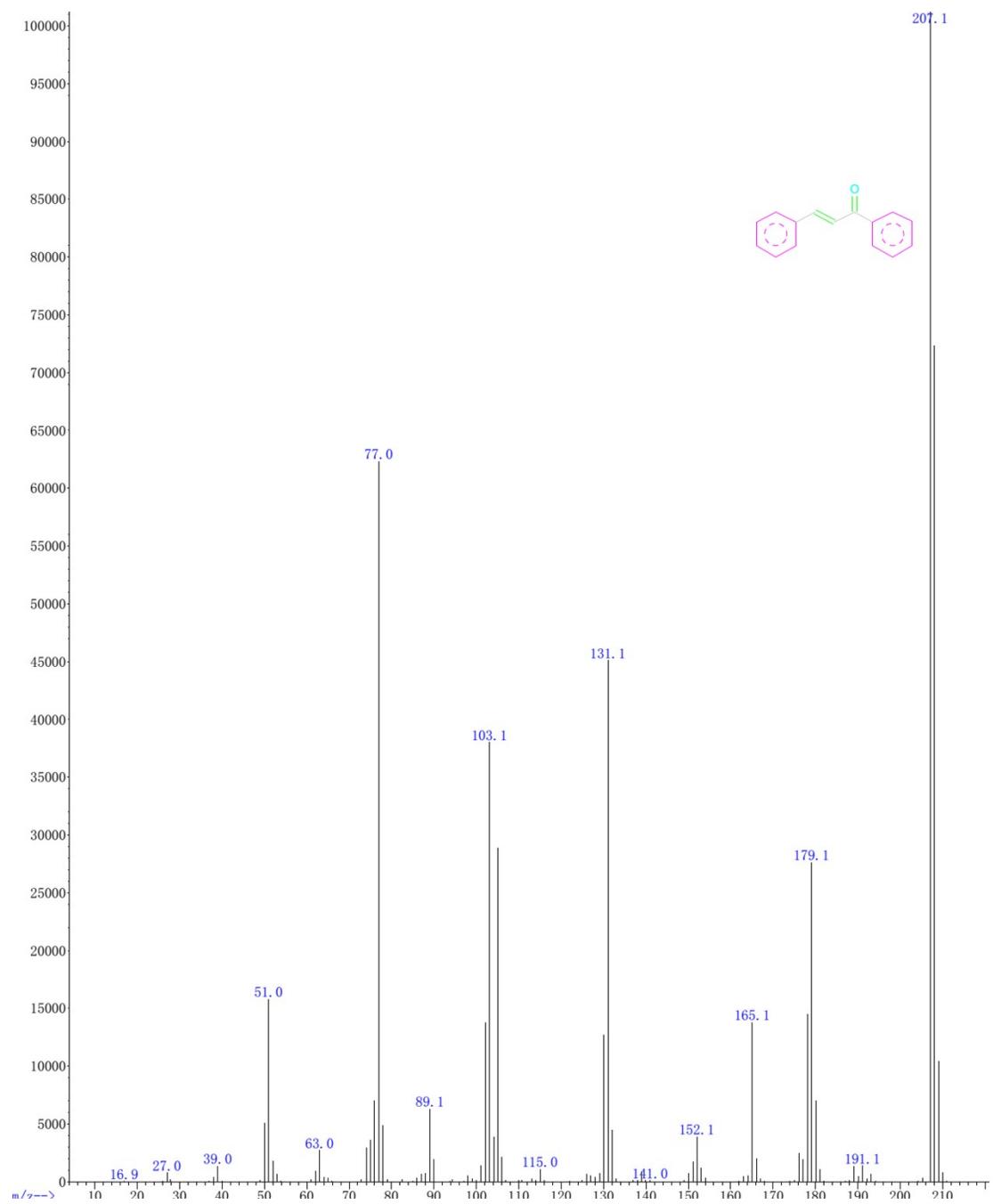
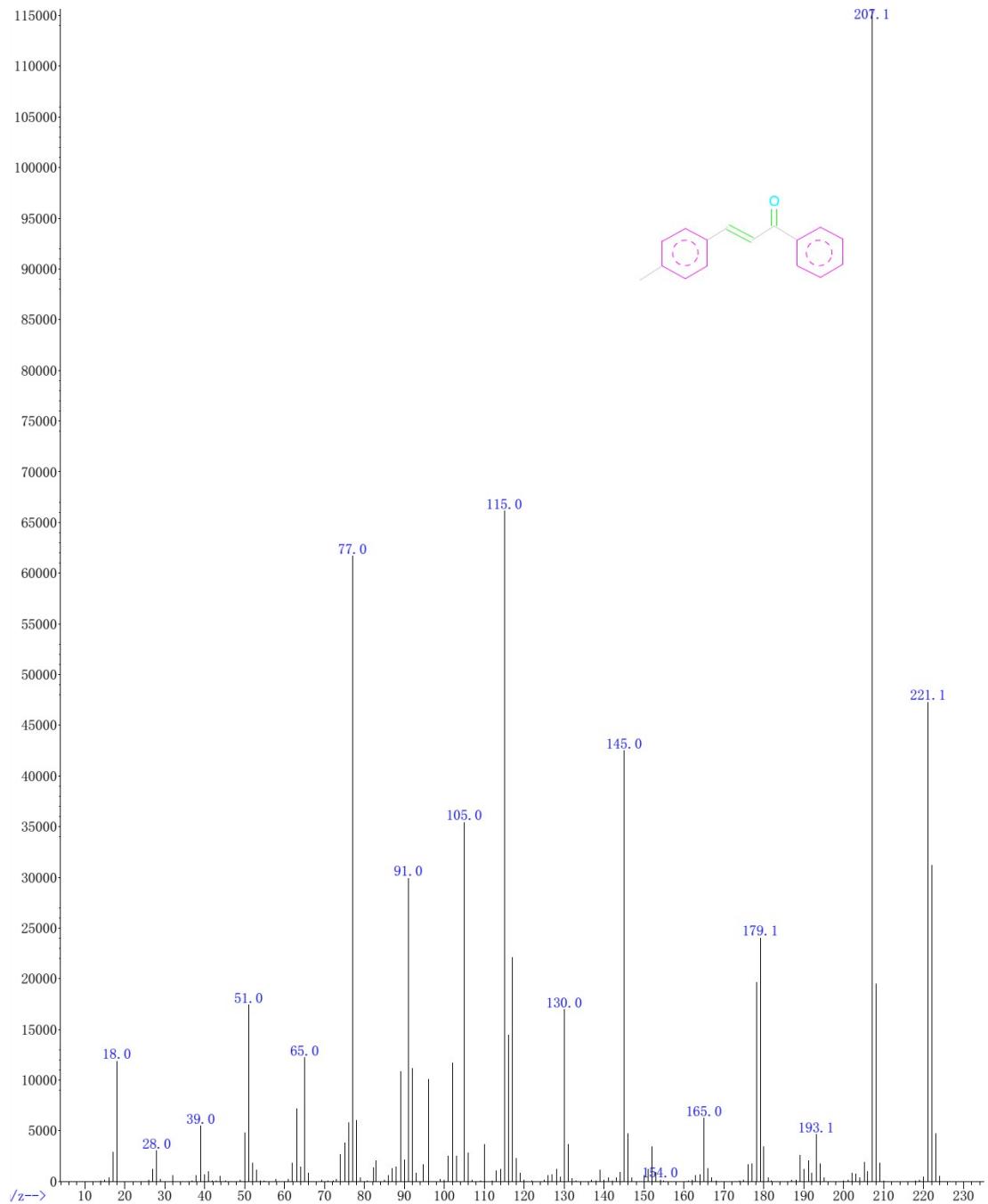
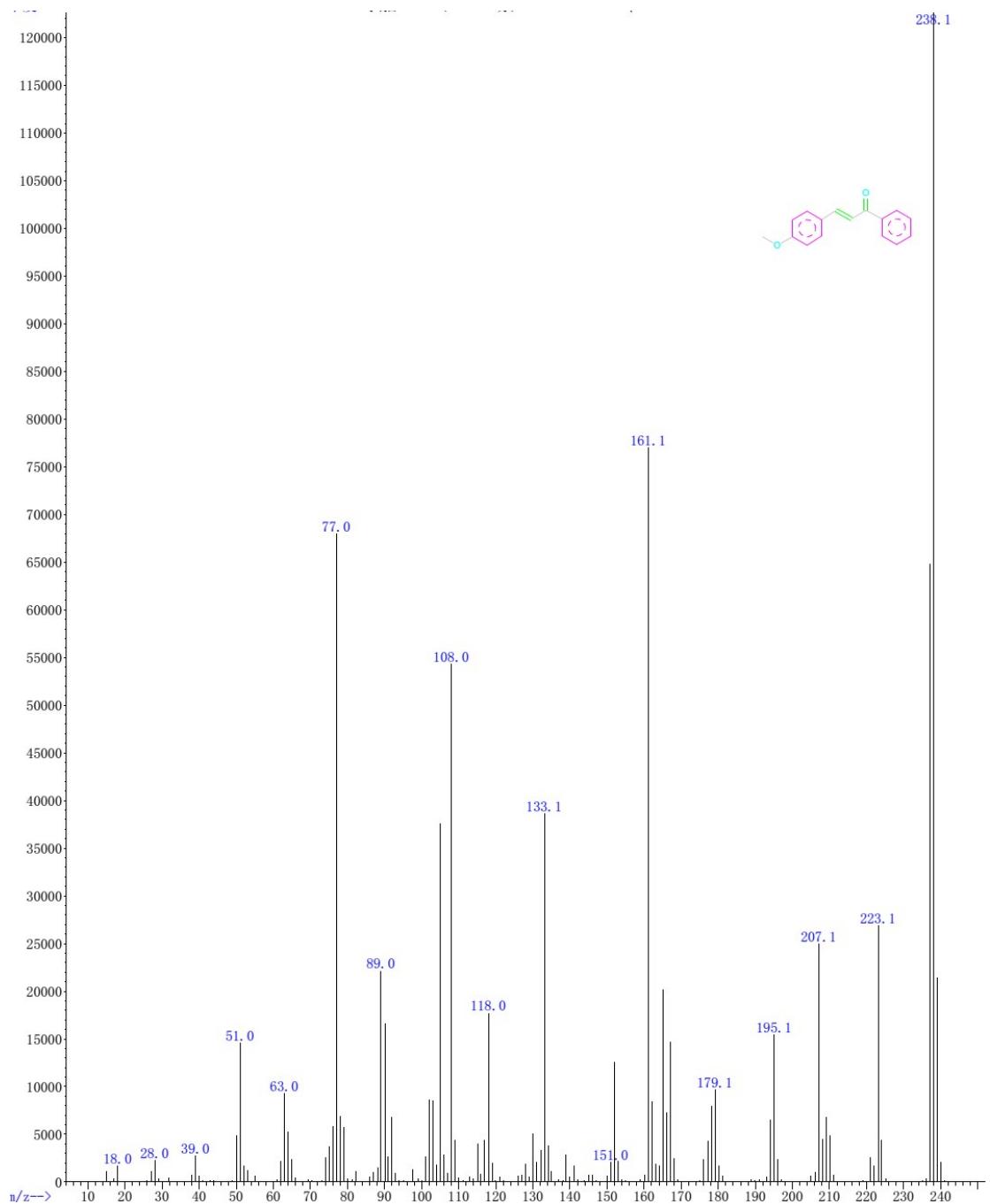
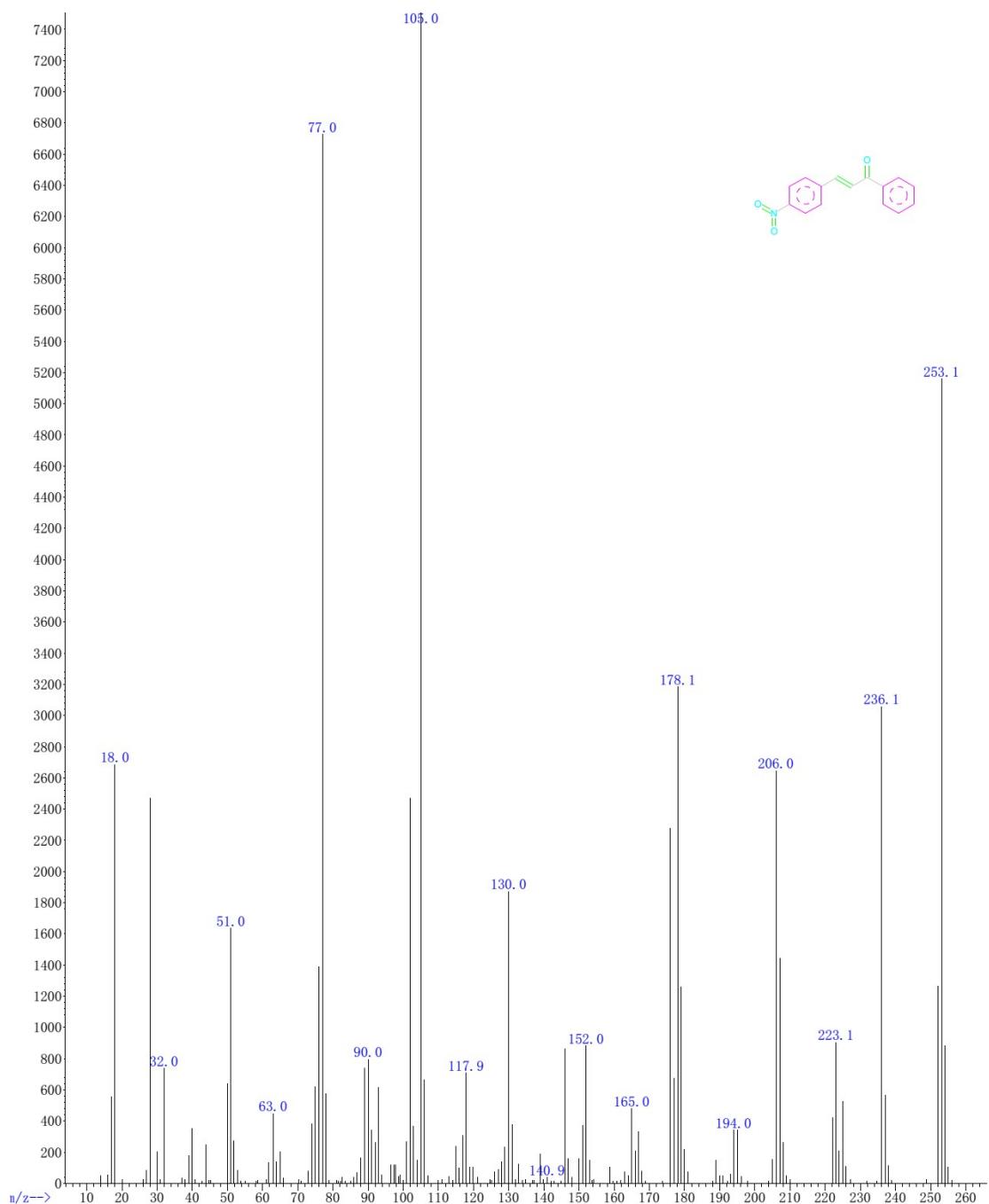


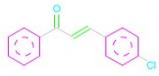
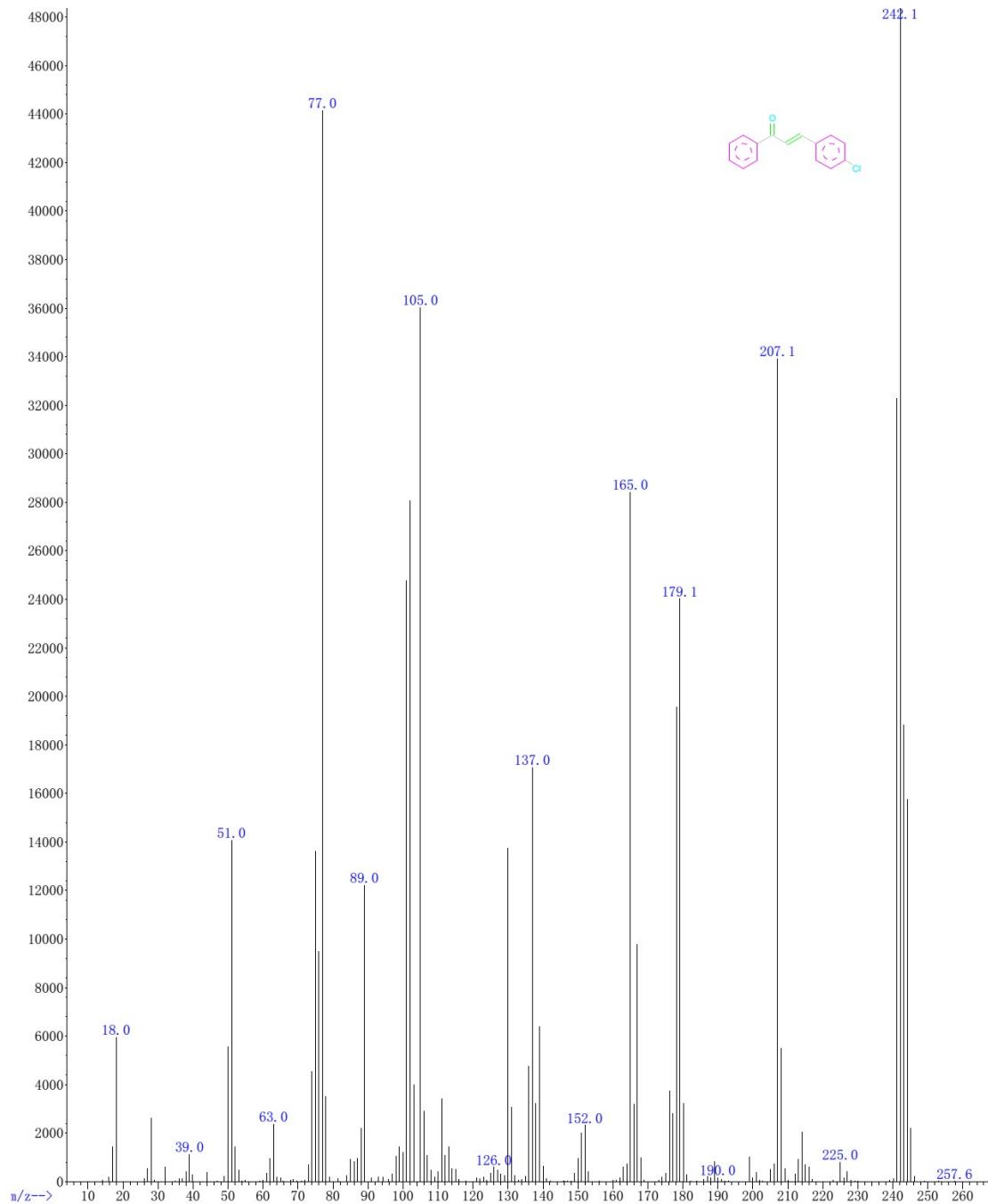
Fig. S4 Raman spectra (532 nm) of the CeO_2 with different morphologies

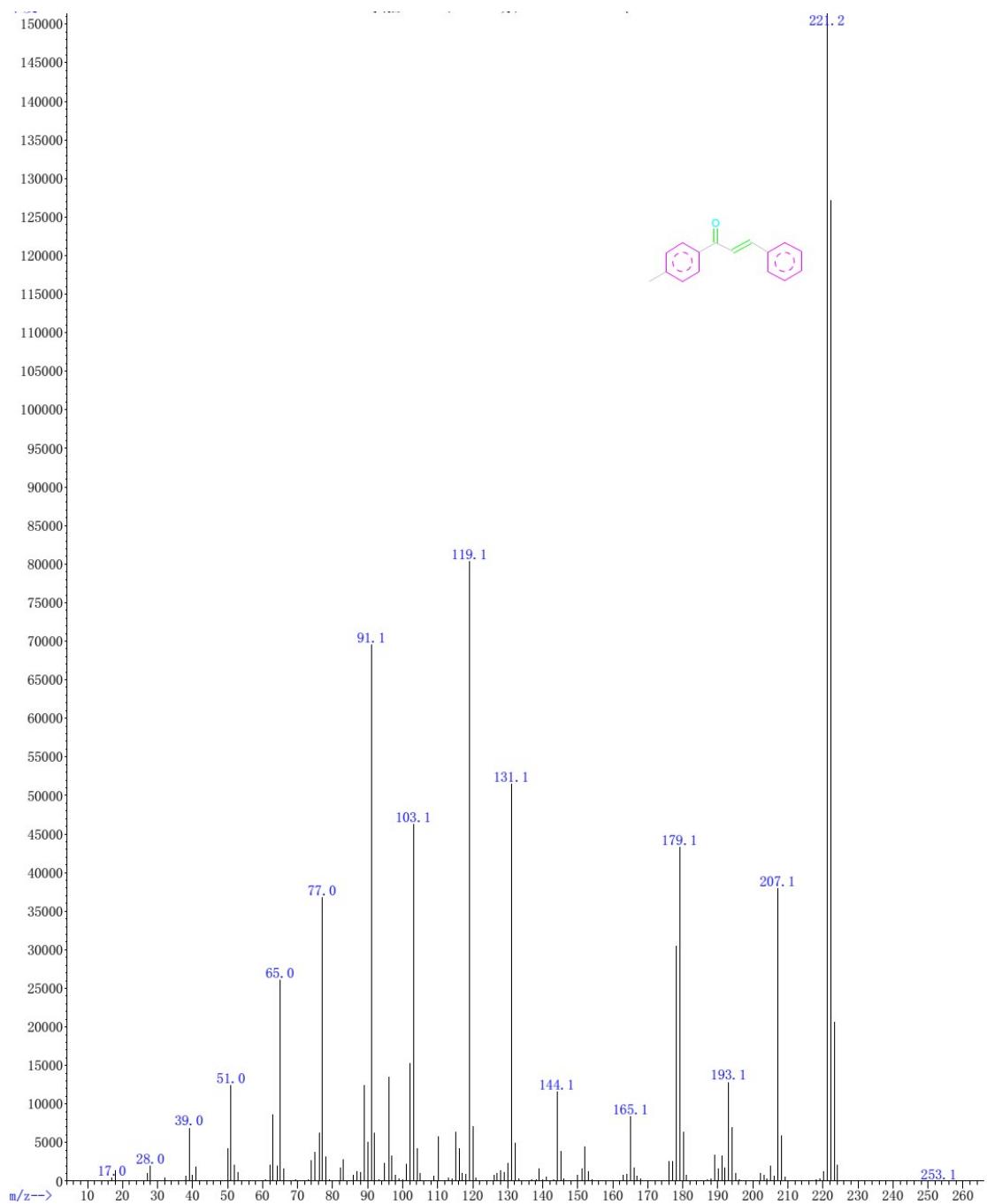


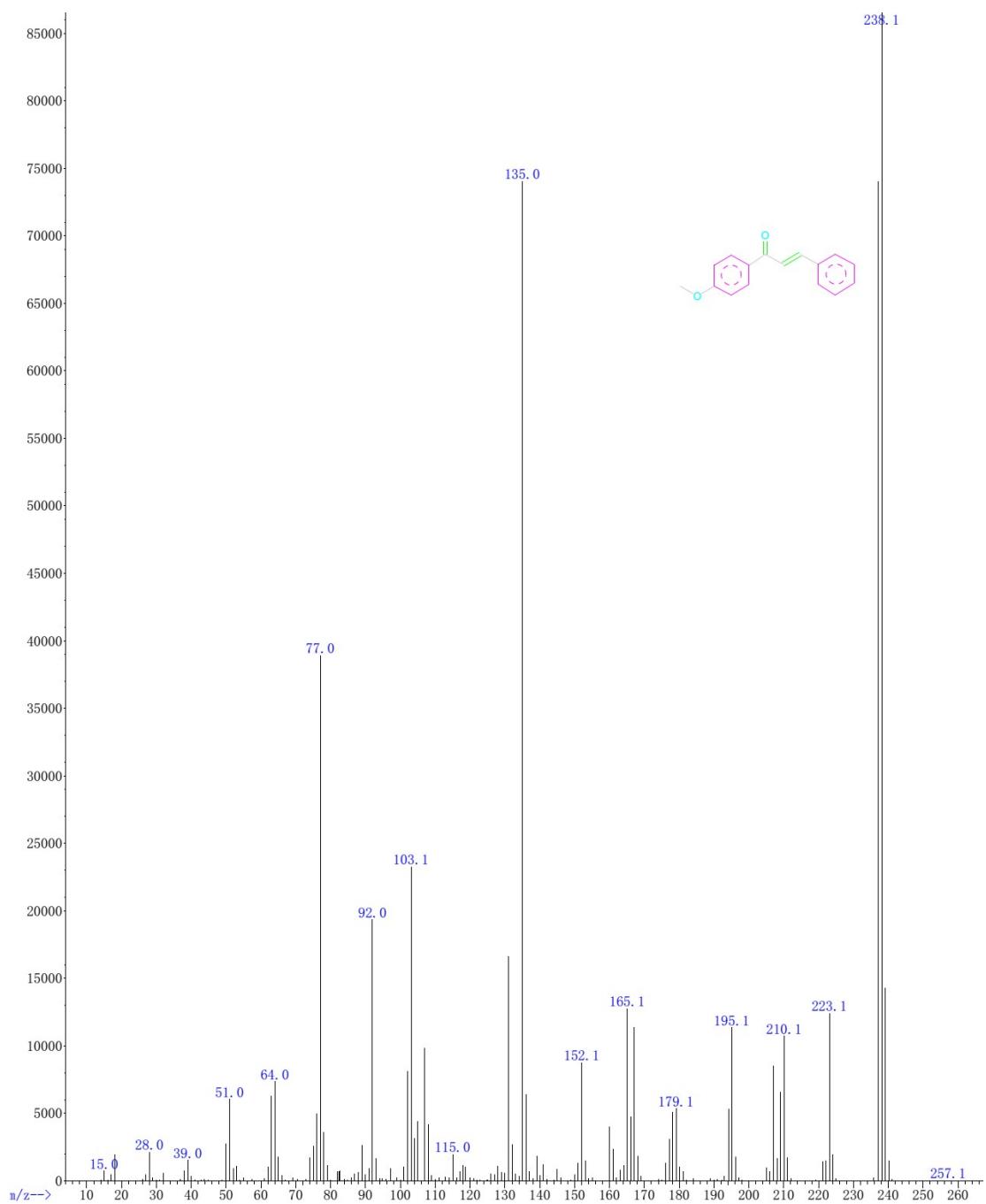


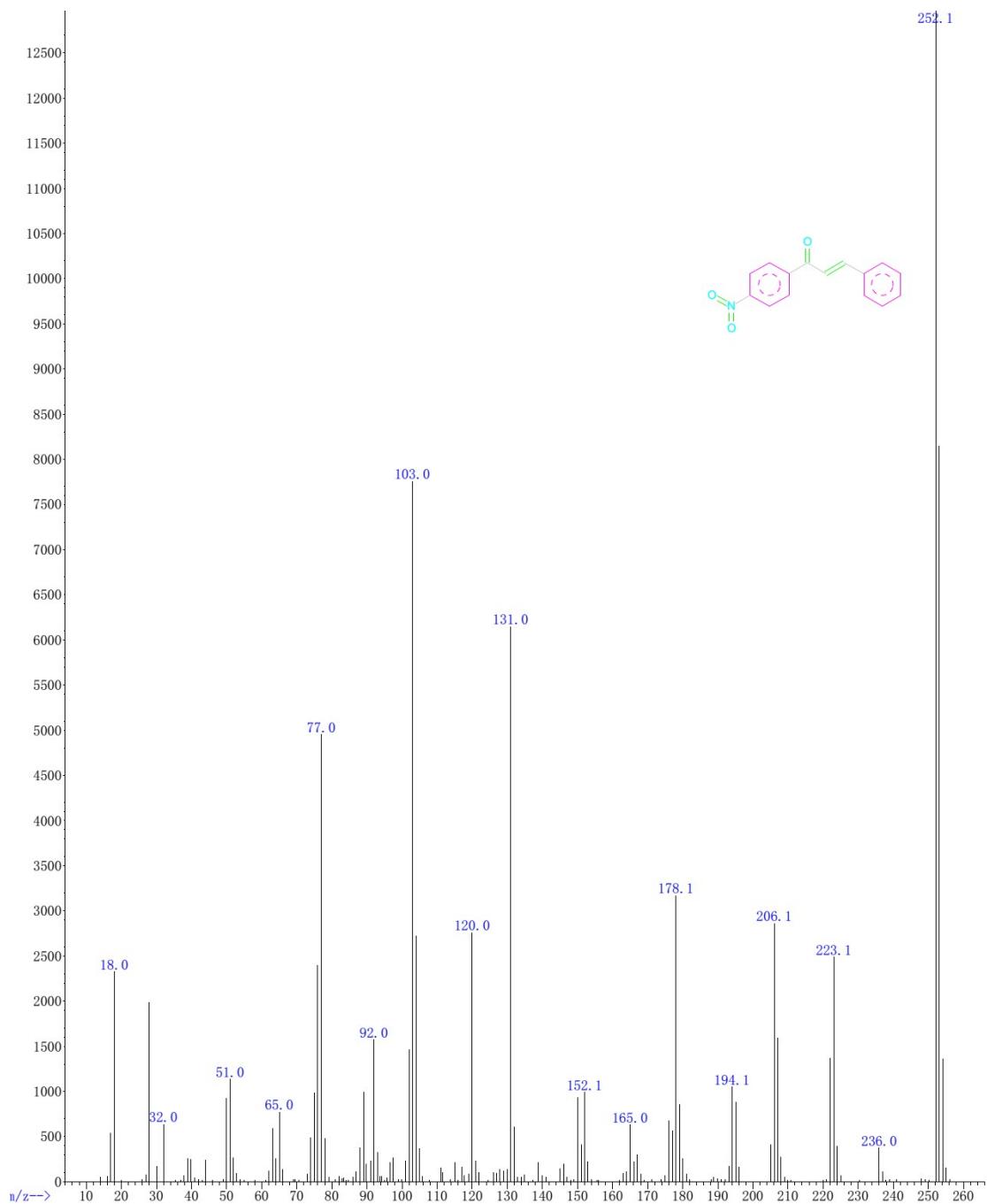


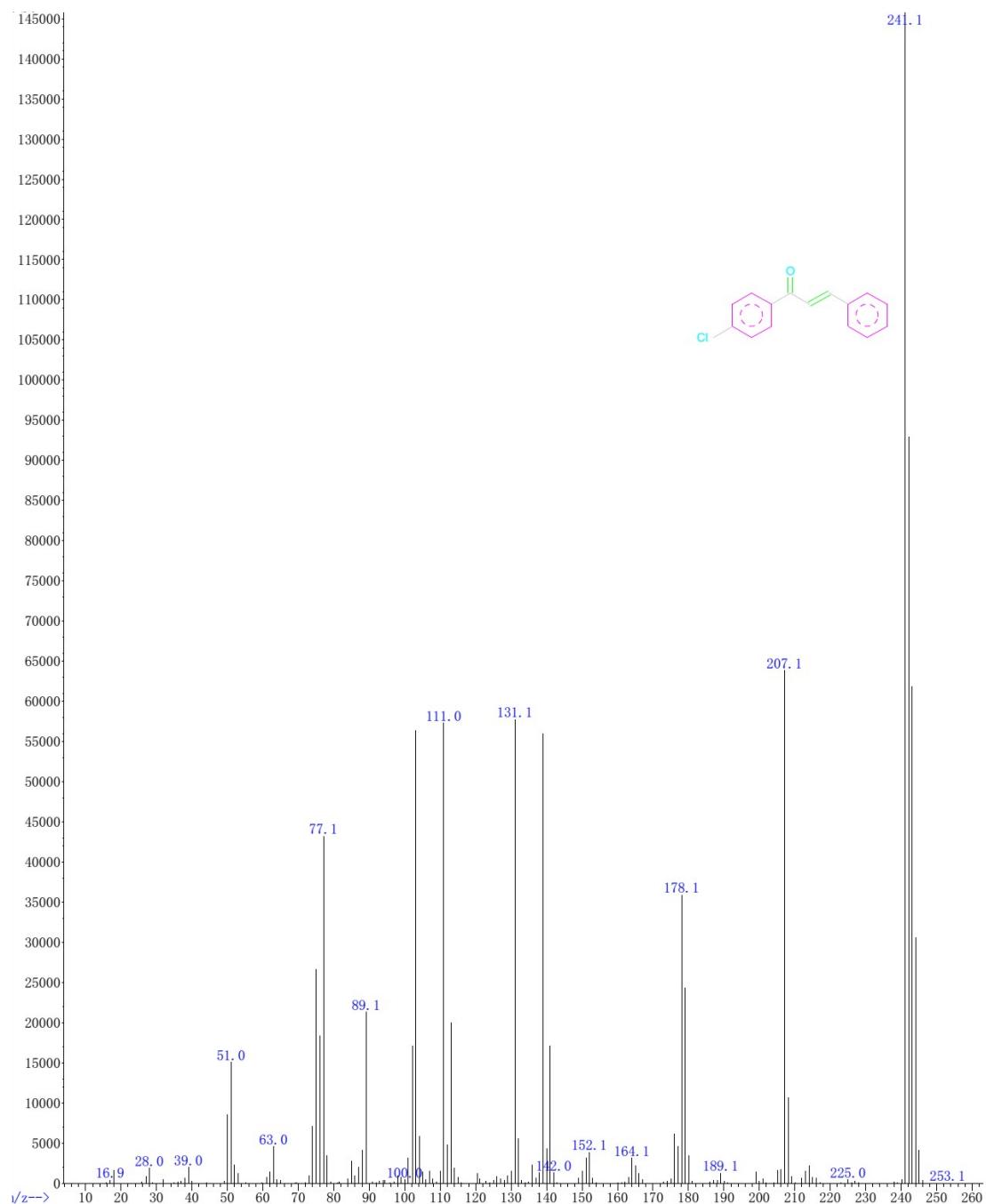


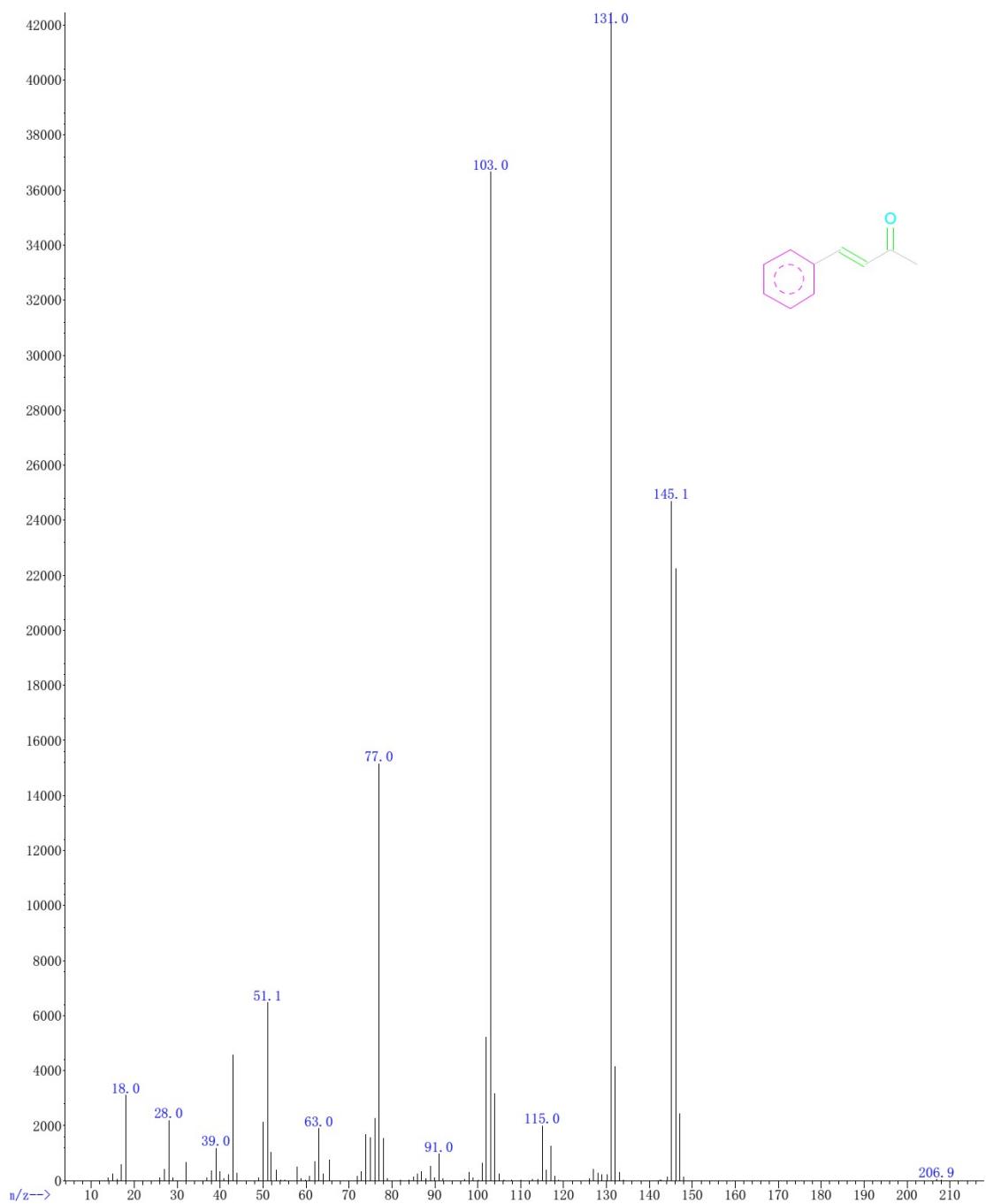


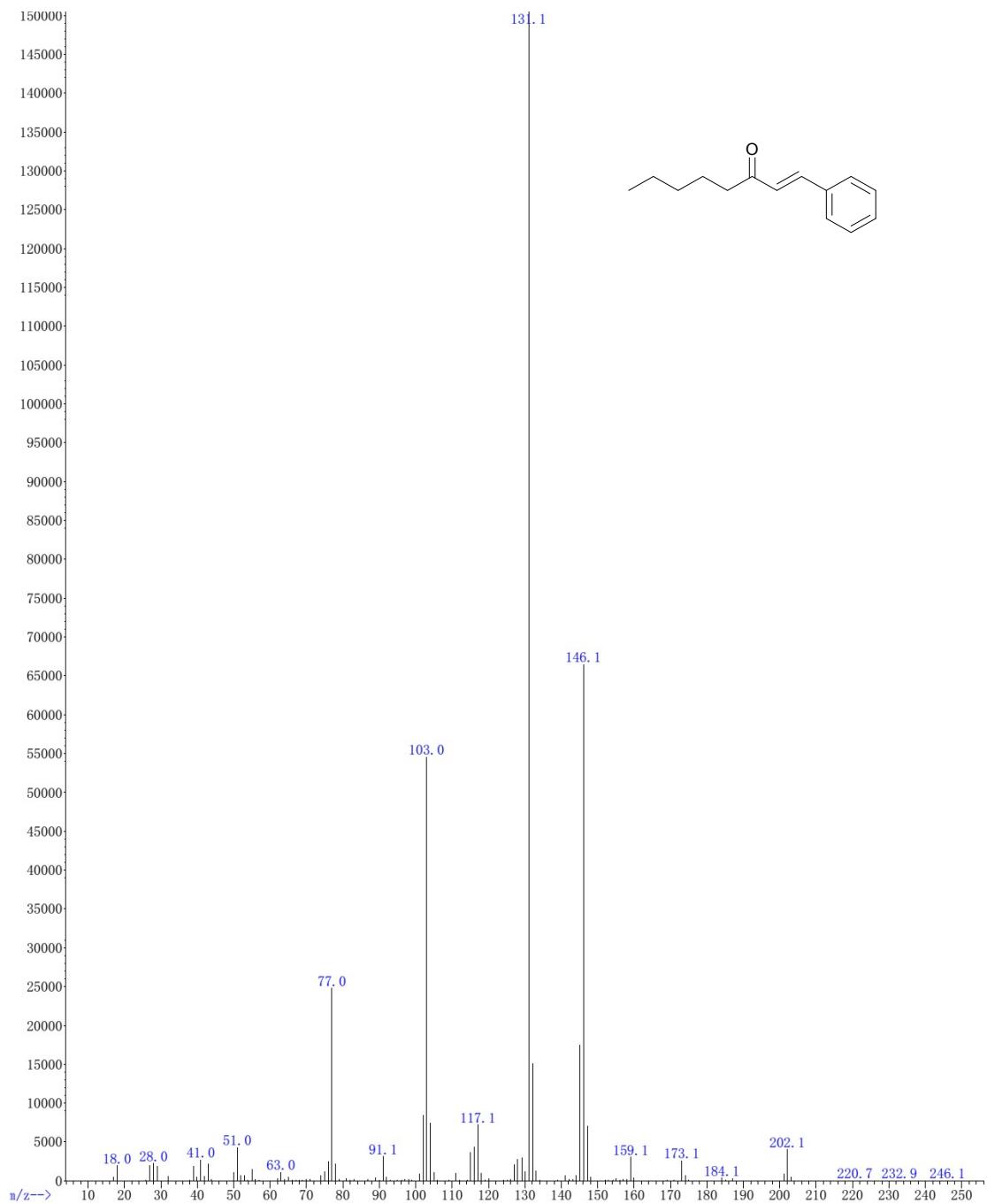




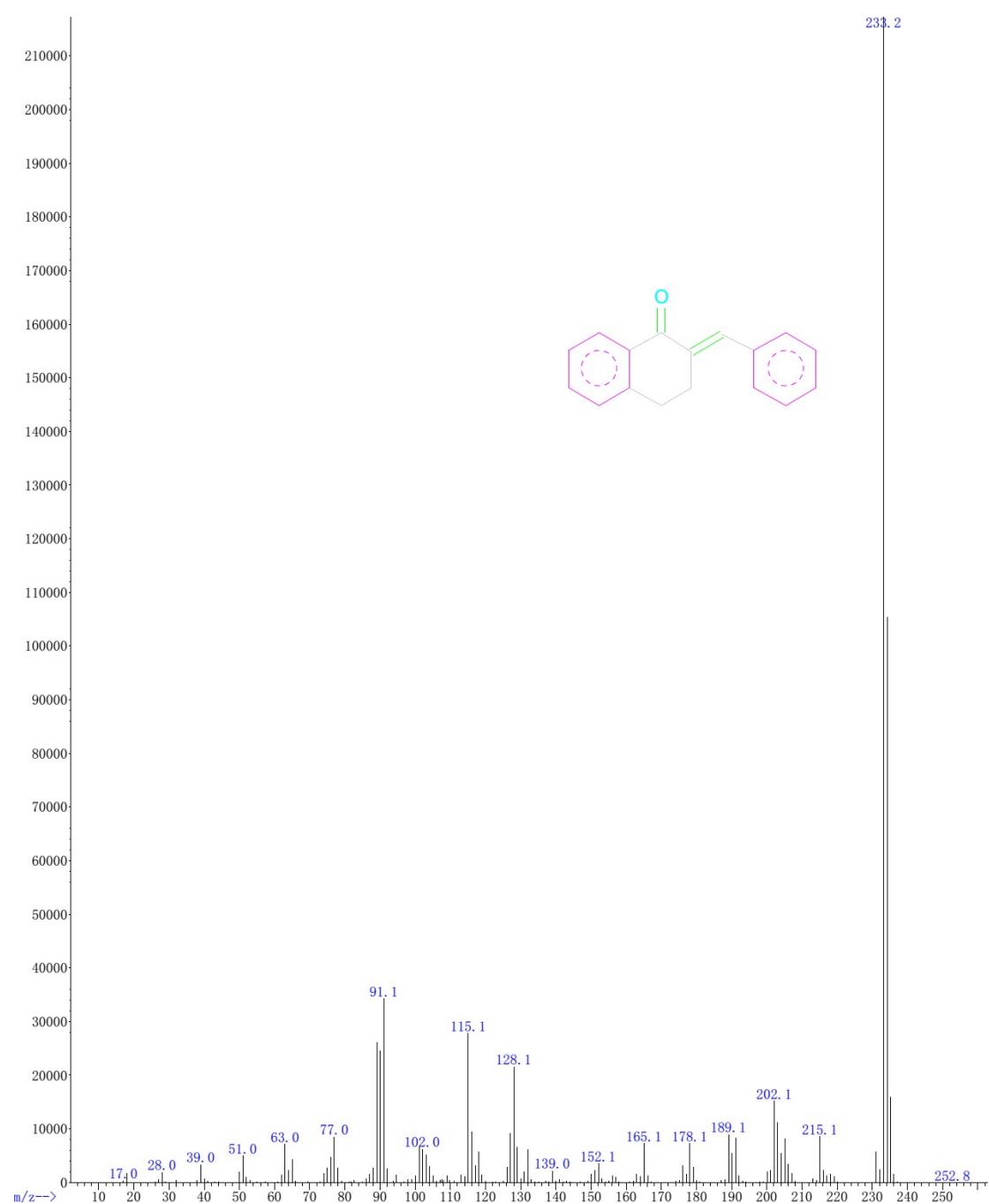








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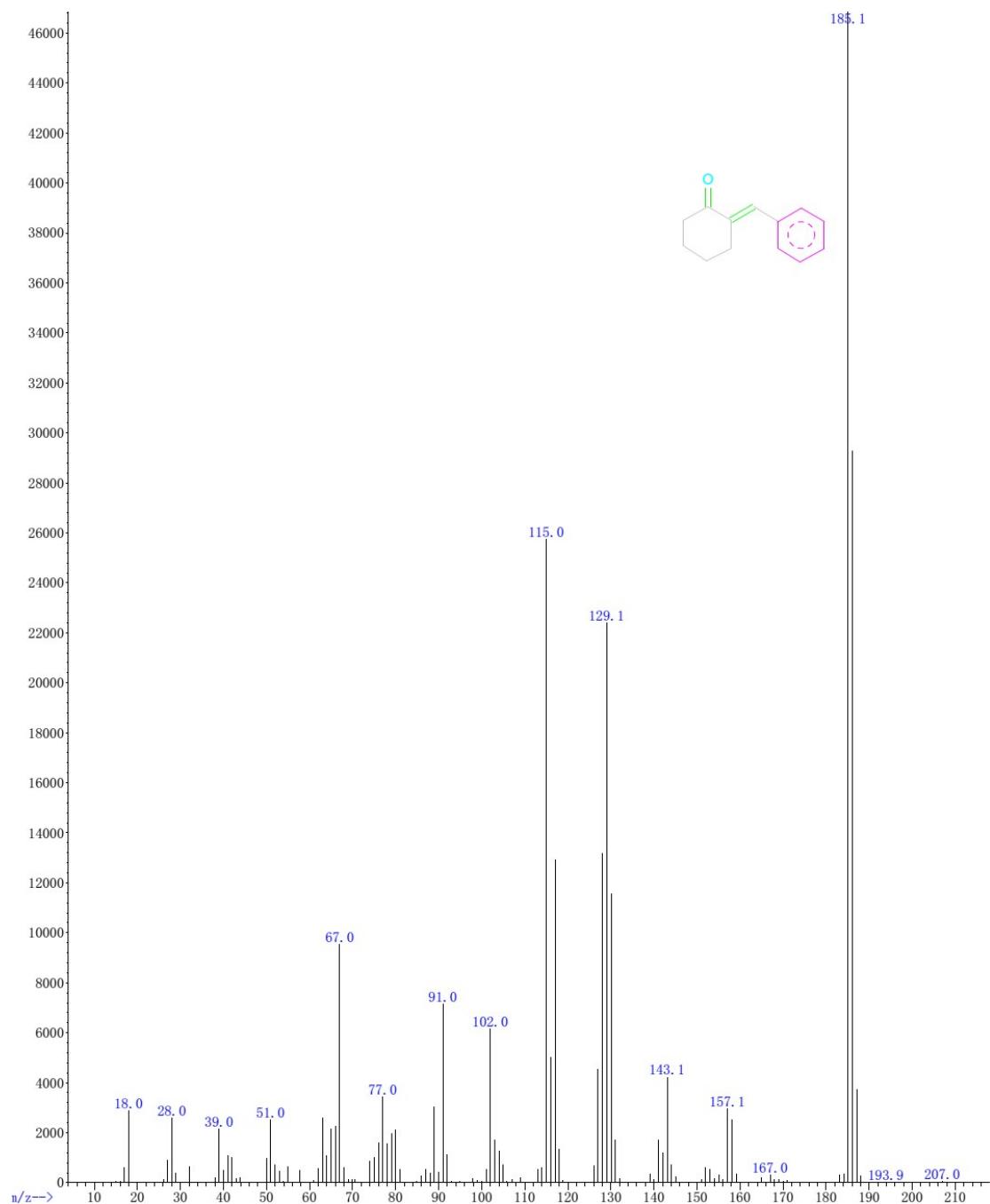


Fig. S5 MS of different corresponding coupling products