

## Supplementary Materials

**Table S1:** Dilution reliability of MG in rat plasma ( $\bar{x} \pm s$ , ng/mL)

**Table S2:** Carryover of MG and MG-Na in rat plasma ( $\bar{x} \pm s$ , ng/mL)

**Table S3:** Mean Noncompartmental Pharmacokinetic parameters of MG and MG-Na ( $\bar{x} \pm s$ )

**Figure S1:** The synthesis procedures for MG-Na.

**Figure S2:** Blank plasma (A), blank plasma + standard solution of MG or MG-Na (LLOQ, 1.0 ng/mL) + IS standard working solution (100 ng/mL) (B), plasma after oral administration MG or MG-Na for 120 minutes (C)

**Figure S3:** The calibration curves of MG and MG-Na (ng/mL).

**Figure S4:** The plasma concentration-time curve of MG and MG-Na in a single one.

**Table S1:** Dilution reliability of MG in rat plasma ( $\bar{x} \pm s$ , ng/mL)

	Plasma sample	Dilution stability		
		Means concentration	RSD (%)	RE (%)
MG	10	10.417 $\pm$ 0.321	3.1	4.2
	100	103.837 $\pm$ 4.753	4.6	3.8
	500	492.575 $\pm$ 21.581	4.4	-1.5
MG-Na	10	10.298 $\pm$ 0.419	4.1	3.0
	100	98.285 $\pm$ 5.391	5.5	-1.7
	500	504.519 $\pm$ 7.981	1.6	0.9

\* $P < 0.05$ , indicates significant differences from the MG.

\*\* $P < 0.01$ , indicates highly significant differences from the MG.

**Table S2:** Carryover of MG and MG-Na in rat plasma ( $\bar{x} \pm s$ , ng/mL)

	Plasma sample	Means cconcentration	RSD (%)	RE (%)
MG	0	0.073 $\pm$ 0.006	8.2	7.3
	500	493.432 $\pm$ 13.491	2.7	-1.3
MG-Na	0	0.063 $\pm$ 0.007	9.5	6.3
	500	491.392 $\pm$ 14.421	2.9	-1.7

\* $P < 0.05$ , indicates significant differences from the MG.

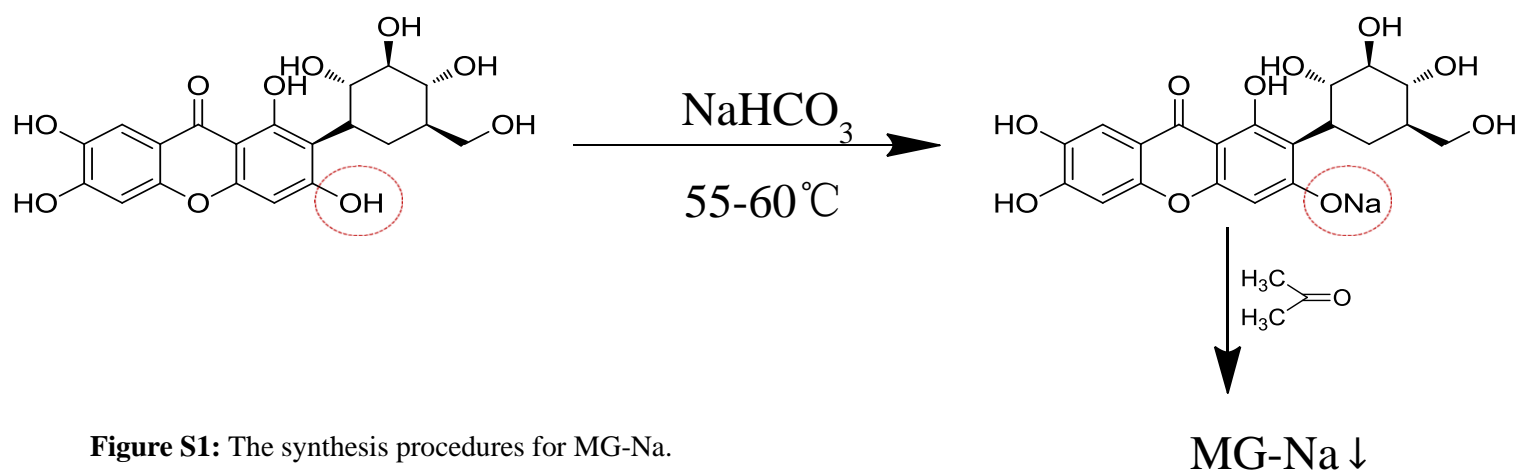
\*\* $P < 0.01$ , indicates highly significant differences from the MG.

**Table S3:** Mean Noncompartmental Pharmacokinetic parameters of MG and MG-Na ( $\bar{x} \pm s$ )

Parameter	MG	MG-Na
C <sub>max</sub> (ng/mL)	24.795 $\pm$ 3.647	492.864 $\pm$ 20.375**
T <sub>max</sub> (min)	60.000 $\pm$ 0.000	15.000 $\pm$ 0.000**
AUC (0-t)(ng /mL min)	10251.507 $\pm$ 873.663	45559.161 $\pm$ 695.373**
AUC (0- $\infty$ )(ng /mL min)	10543.594 $\pm$ 977.325	46198.972 $\pm$ 861.735**
AUMC(0-t)(min)	4791797.06 $\pm$ 764578.375	9786219.509 $\pm$ 15829.235**
AUMC(0- $\infty$ )(min)	6608077.256 $\pm$ 965842.653	12365709.34 $\pm$ 2016839.398**
VRT(0-t)(min <sup>2</sup> )	252238.617 $\pm$ 45368.609	177056.275 $\pm$ 28384.912**
VRT(0- $\infty$ )(min <sup>2</sup> )	576774.774 $\pm$ 84327.327	392638.26 $\pm$ 73849.338**
MRT (0-t)(min)	467.424 $\pm$ 25.898	214.802 $\pm$ 15.671**
MRT(0- $\infty$ )(min)	626.739 $\pm$ 125.783	267.662 $\pm$ 48.644**
t <sub>1/2z</sub> (min)	455.955 $\pm$ 12.736	803.95 $\pm$ 37.984**
CL <sub>z</sub> /F (L/min kg)	9.484 $\pm$ 0.172	2.165 $\pm$ 0.103**
V <sub>z</sub> /F (L/kg)	6240.223 $\pm$ 48.792	2511.096 $\pm$ 85.798**

\*  $P < 0.05$ , indicates significant differences from the MG.

\*\*  $P < 0.01$ , indicates highly significant differences from the MG.



**Figure S1:** The synthesis procedures for MG-Na.

MG

MG-Na

Carbamazepine

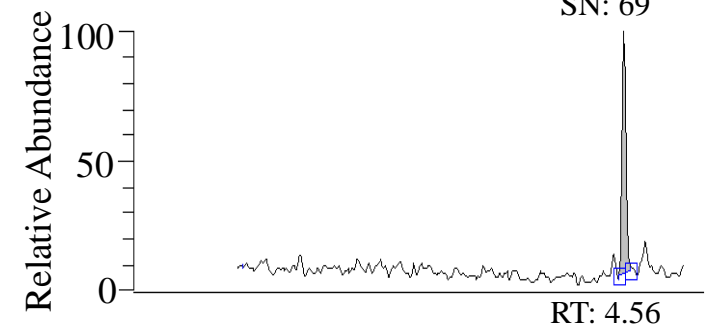
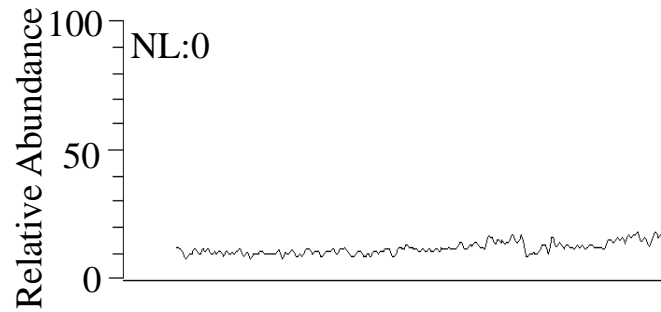
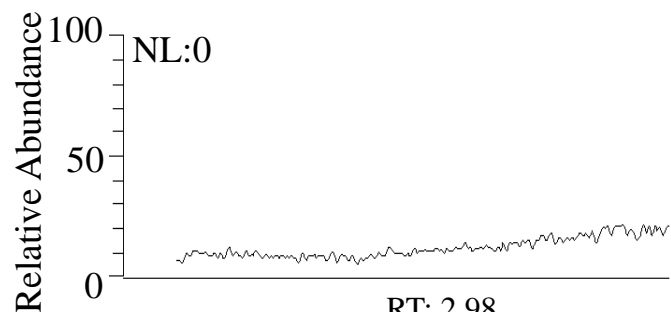
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RT: 0.00-12.01

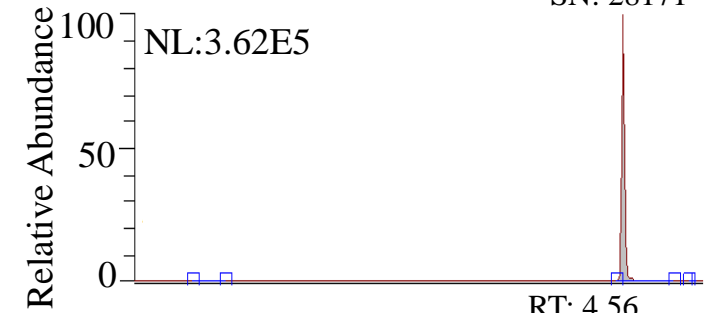
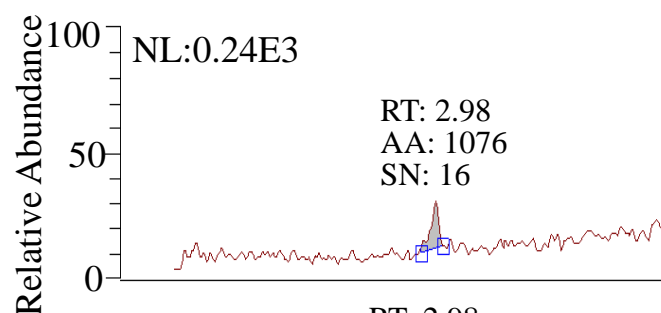
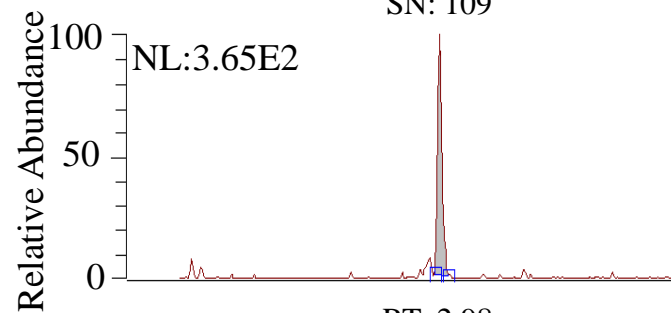
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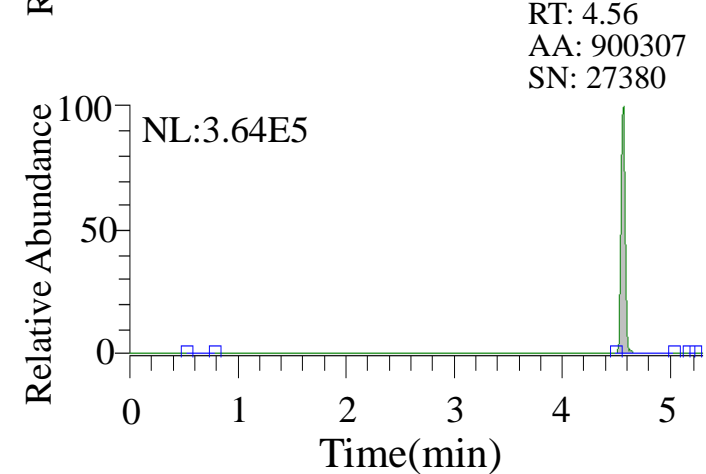
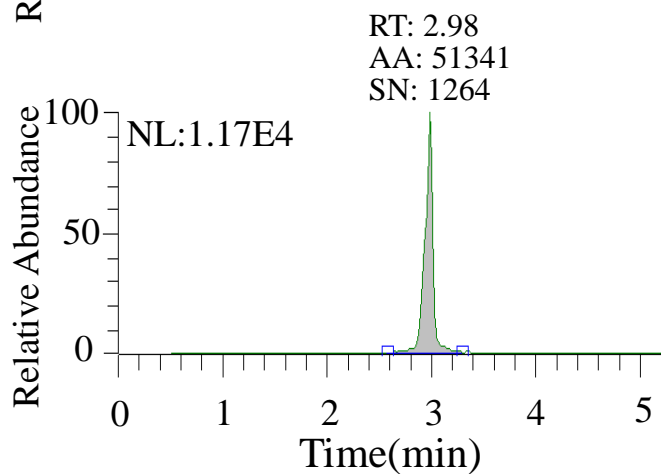
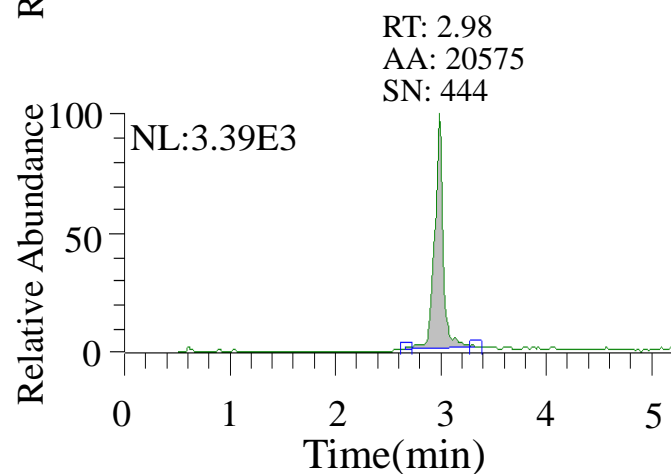
A



B



C



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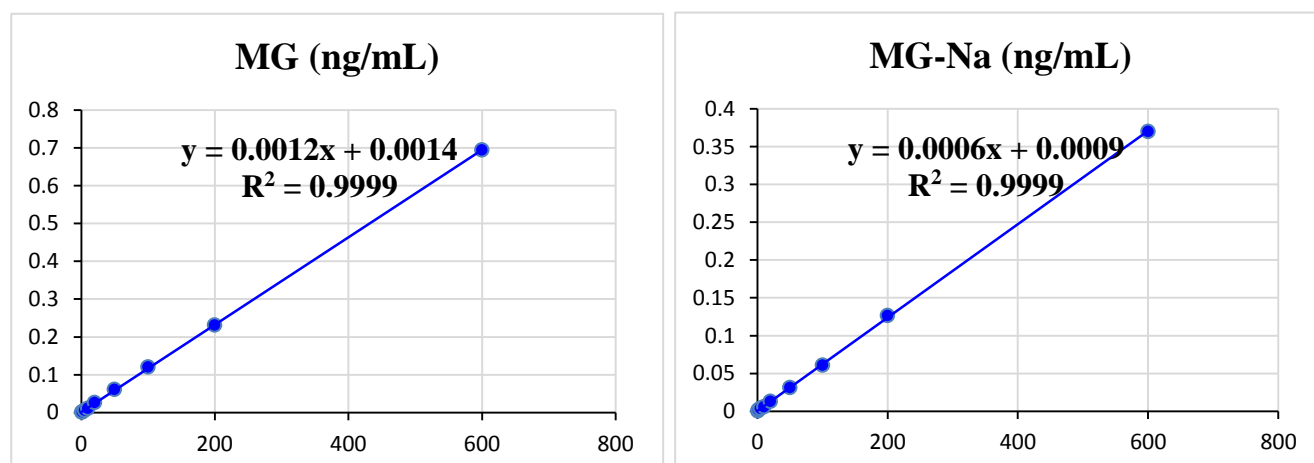
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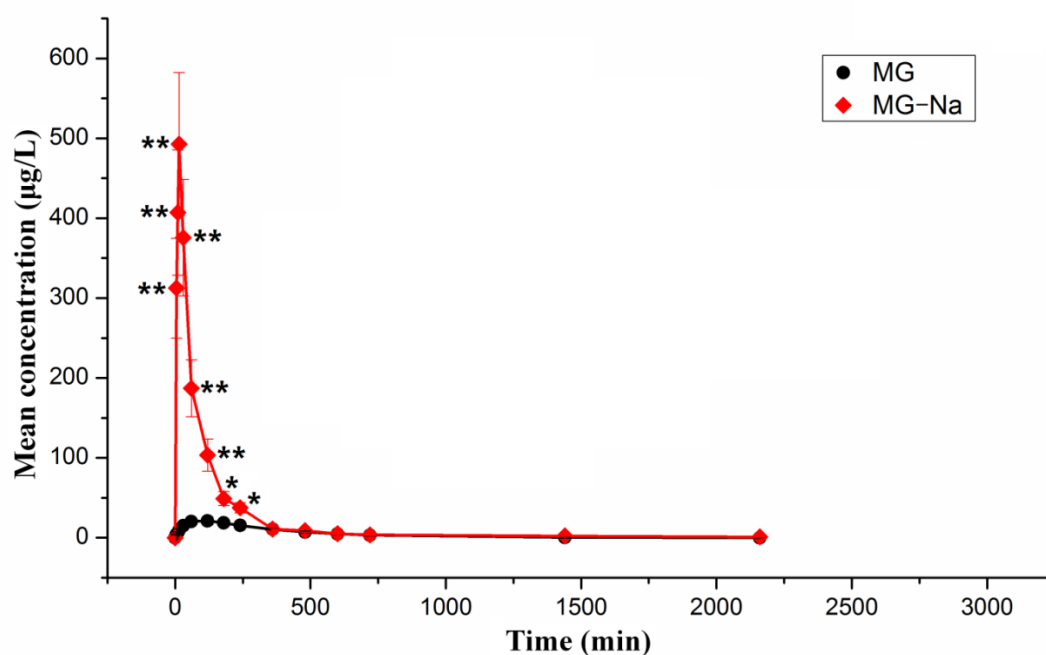
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**Figure S2:** Blank plasma (A), blank plasma + standard solution of MG or MG-Na (LLOQ, 1.0 ng/mL) + IS standard working solution (100 ng/mL) (B), plasma after oral administration MG or MG-Na for 120 minutes (C)



**Figure S3:** The calibration curves of MG and MG-Na (ng/mL).



**Figure S4:** The plasma concentration-time curve of MG and MG-Na in a single one. \*  $P < 0.05$ , indicates significant differences from the MG; \*\*  $P < 0.01$ , indicates highly significant differences from the MG.