

Supporting information

**A facile and green one-step building of Ag/reduced graphene oxide and its
application for catalyst and SERS**

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Table S1 Preparation formula of Ag-rGO

Experiment number	AgNO ₃ amount /g	GO amount /g	Rutin amount /g	Time /h
1	2.5	2.5	10	4
2	2.5	2.5	10	8
3	2.5	2.5	10	12
4	0.5	2.5	10	12
5	1.5	2.5	10	12
6	5	2.5	10	12
7	2.5	2.5	5	12
8	2.5	2.5	20	12

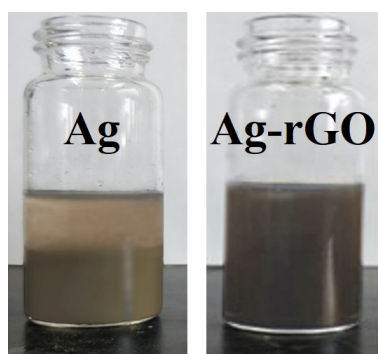


Fig.S1 Digital photos of Ag and Ag-rGO dispersions after storage for 5 days

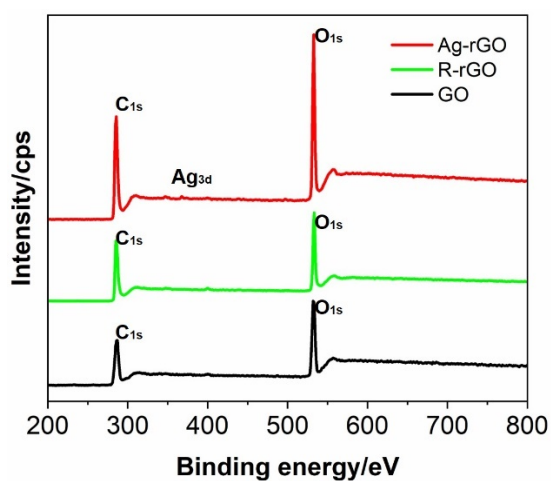
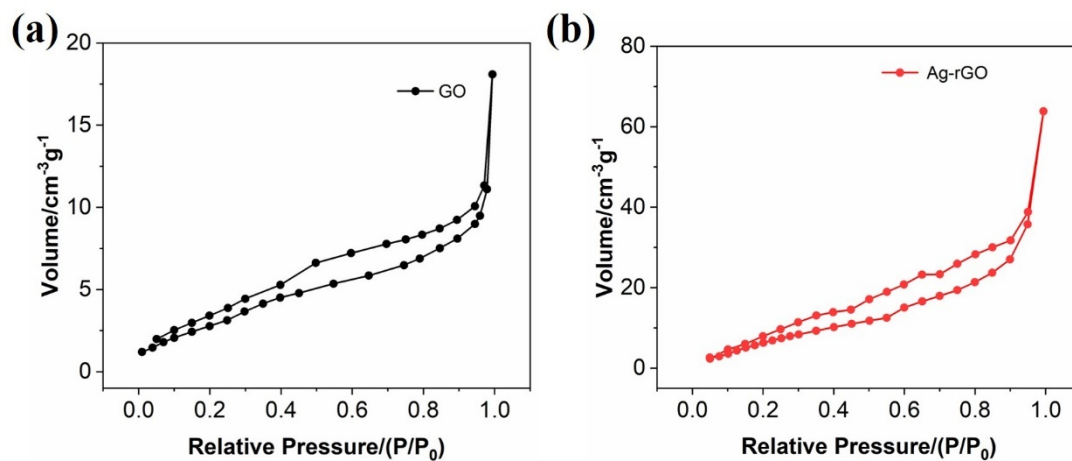


Fig.S2 XPS spectra: Survey spectra of GO, R-rGO, and Ag-rGO

Table S2 The contents of C and O in the GO, R-rGO and Ag-rGO (wt.%)

	C	O	Ag	C/O
GO	62.97	37.02	-	1.70
R-rGO	71.73	28.17	-	2.55
Ag-rGO	69.36	27.64	3.01	2.51

**Fig.S3** The Adsorption/desorption isotherm plot of GO(a) and Ag-rGO(b)**Table S3** BET surface area, pore volume, and average pore size in GO and Ag-rGO

	Surface areas (m ² /g)	Pore volume (cm ³ /g)	Average pore size (nm)
GO	12.01	0.02	3.10
Ag-rGO	35.67	0.03	3.79

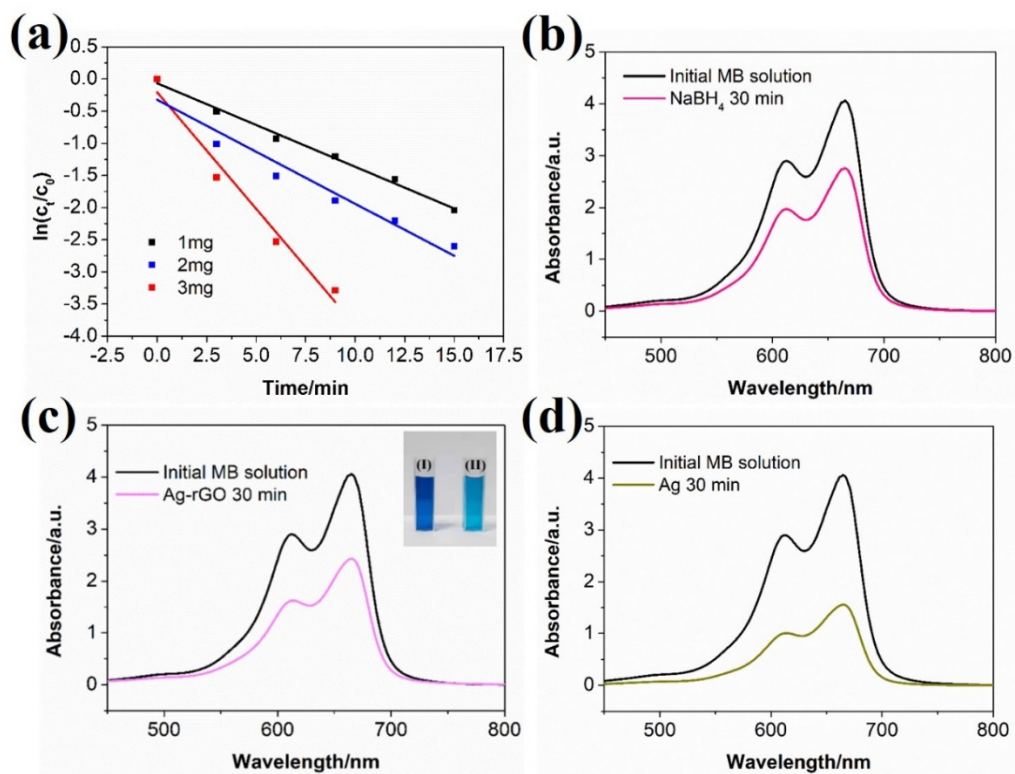


Fig.S4 (a) Variation of $\ln c_t/c_0$ with reaction time when the addition amount of Ag-rGO is 1 mg, 2 mg, and 3 mg; (b) UV-vis spectra of MB solution after reduced by NaBH_4 ; (c) UV-vis spectra of MB solution in presence of Ag-rGO; (d) UV-vis spectra of MB solution after reduced by NaBH_4 when the addition amount of Ag is 3 mg

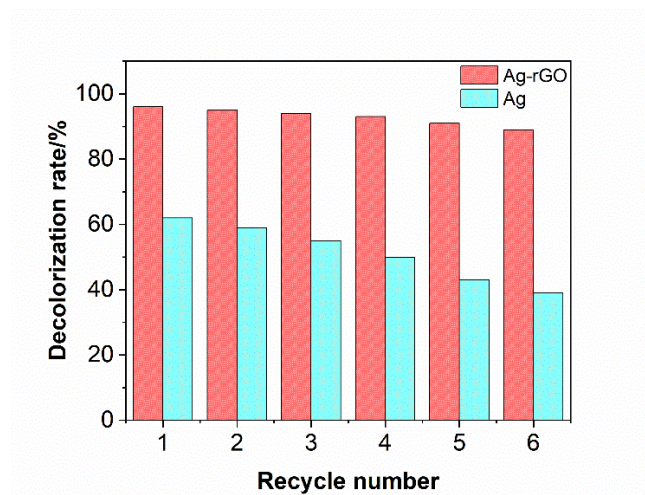


Fig.S5 The stability of Ag and Ag-rGO

Table S4 Reproducibility analysis of SERS signals collected from different positions on the same substrate or from different substrates of Ag-rGO or Ag

Peak position (cm ⁻¹)	From different positions on the same substrate, D/%		From different substrates, D/%	
	Ag-rGO substrate	Ag substrate	Ag-rGO substrate	Ag substrate
612	5.32	7.69	6.77	9.07
774	4.95	7.34	5.65	8.63
1179	7.01	9.65	7.79	10.63
1363	6.73	7.79	7.51	9.79
1512	6.65	7.43	7.33	9.61