Electronic Supplementary Material (ESI) for RSC Advances.

Azo-coupling Reaction-Based Surface Enhanced Resonance Raman Scattering Approach for Ultrasensitive Detection of Salbutamol

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(Supporting Information)

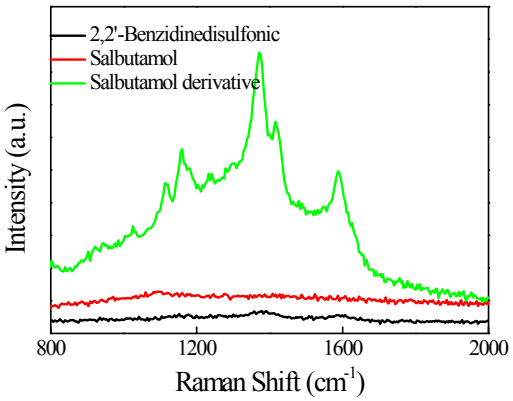

Figure S1. SERS spectrum of 10 mM SAL, 2,2'-Benzidinedisulfonic acid and SAL derivative, respectively.

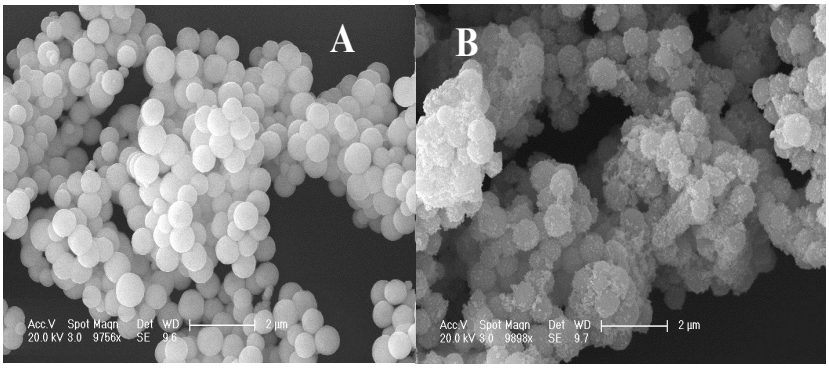

Figure S2. SEM image of the magnetic nanoparticle of (A) Fe_3O_4 and (B) Fe_3O_4@Ag, respectively.

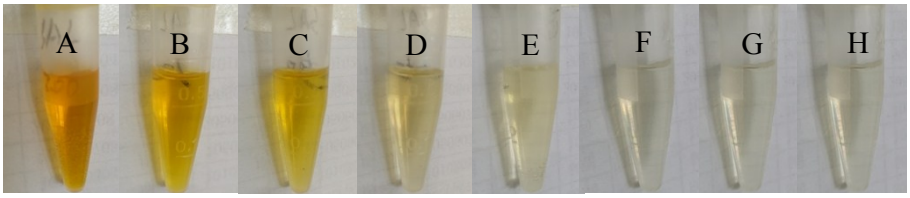

Figure S3. Representative photography of the colorimetric sensing to different concentration of (A) 8.37×10^{-4} M, (B) 4.18×10^{-4} M, (C) 2.09×10^{-4} M, (D) 4.18×10^{-5} M, (E) 2.09×10^{-5} M, (F) 1.05×10^{-5} M, (G) 4.18×10^{-6} M, and (H) 0 M, respectively, for SAL in solution.

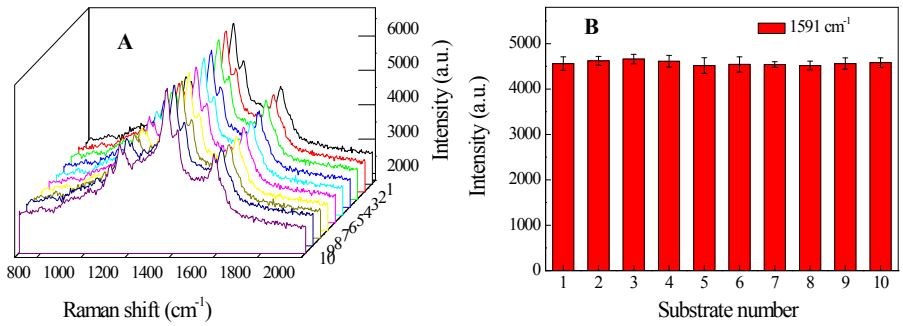

Figure S4. Examination of the reproducibility for azo reaction-based SERRS in SAL detection. (A) Sample-to-sample SERRS spectra of SAL from 10 parallel batches with a concentration of 1.0×10^{-7} M, which are measured on randomly selected spot. (B) The corresponding SERRS intensity variation at 1591 cm^{-1}. Each intensity value with error bar represents the average one obtained from different spots.

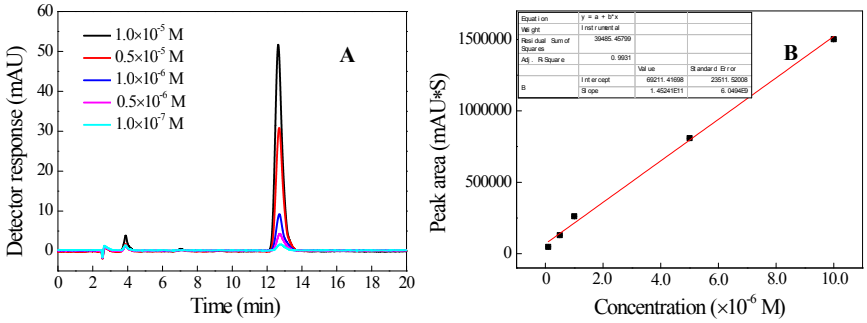

Figure S5. (A) Chromatograms of SAL at different concentrations; (B) Standard curves of SAL from the data of (A).

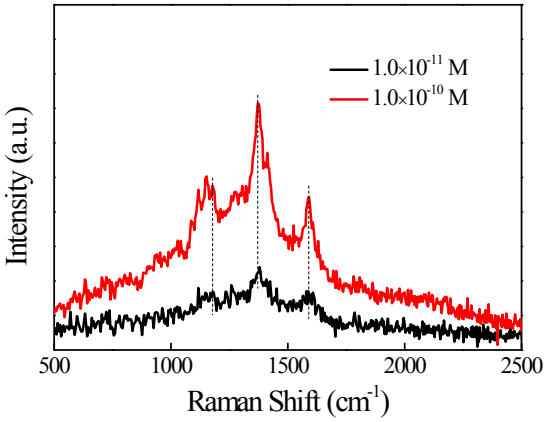

Figure S6. Determination of the limit of detection (LOD) for real sample.

Table S1. A comparison of different methods for SAL detection.

No.	Methods	Detection limit	Detection time for real sample	Ref.
1	ICT-SERS	3.0 pg/mL (standard solution)	＞21 min	*Food Anal. Methods*, 2016, **9**, 3396-3406.
2	Immunoassays SPR	100 ng/mL (standard solution)	–	*Biosens. Bioelectron.*, 2015 **67**, 356-363.
3	SERS	765 ng/mL (standard solution)	–	*Langmuir*, 2010, **26**, 14663–14670.
4	SERS	2 g/L (standard solution)	30 min	*Chin. J Anal. Chem.*, 2012, **40**, 718-723.
5	Flow injection chemiluminescence immunoassay	0.15 ng/mL (standard solution)	–	*Sens. Actuator B*, 2015, **215**, 323-329.
6	LC-MS/MS	0.3 ng/mL (urine)	＞16 h	*J Chromatogr. B*, 2016, **1025**, 83-91.
7	Electrochemical immunoassay	1.44 pg/mL (standard solution)	–	*Biosens. Bioelectron.*, 2013, **49**, 14-19.
8	Azo-coupling reaction-based SERRS	1.0×10^{-10} M (meat)	＜10 min	This work