

Supplementary Materials

SERS determination of sodium saccharin content on tipping paper of cigarette using AgNPs substrate prepared with a USB-power supply device

Huipeng Deng^a, Zakir H. Talpur^a, Kaijun Wang^a, Yan Kang^a, Yiping Du^{*a}, Dongmei Xu^b, Xinglong Fan^b, Wei Li^{*}

Contents:

Figure S1. Figure S1 SEM images of the AgNPs

Figure S2. High resolution XPS spectra of Ag 3d orbital.

Selection of extract solvent from cigarette paper

Table S1. Chromatographic test conditions

Table S2. The Comparison of different solvents in extracting saccharin sodium from paper

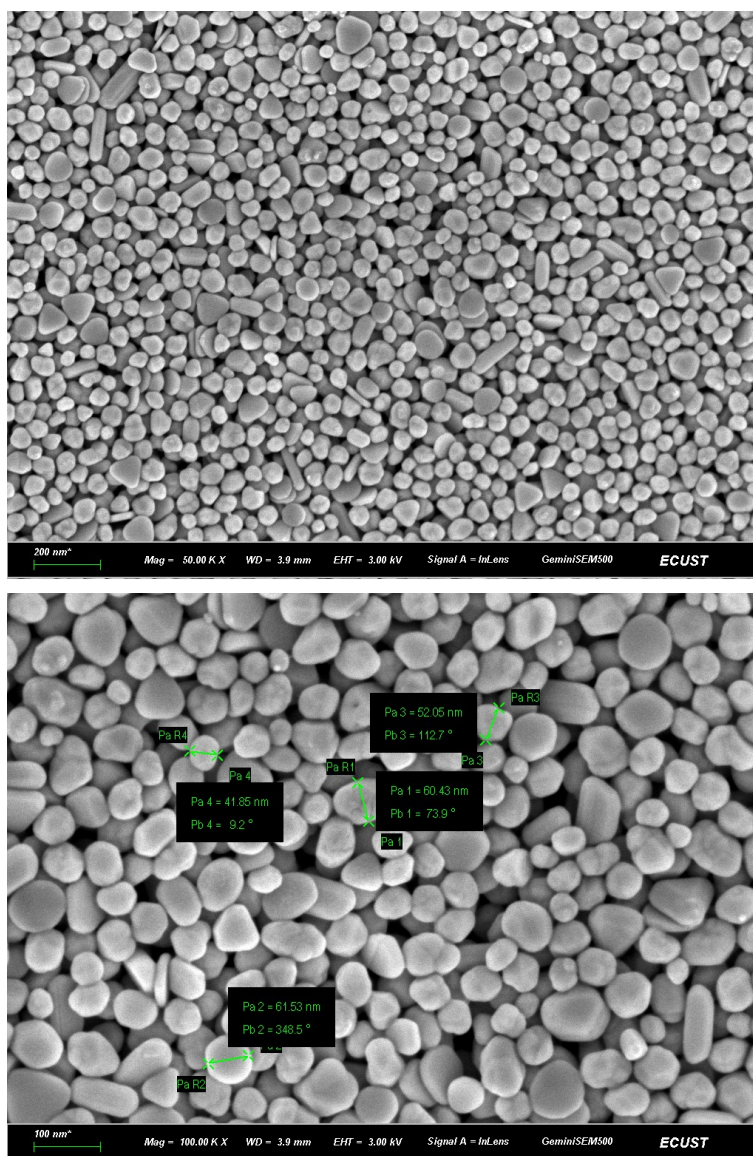


Figure S1 SEM images of the AgNPs synthesized at 40°C

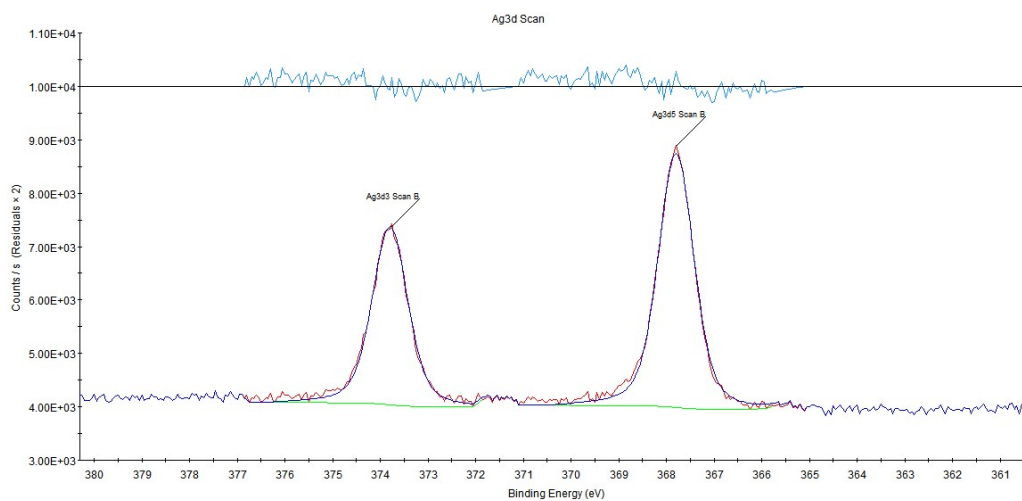


Figure S2 High resolution XPS spectra of Ag 3d orbital

Selection of extract solvent from cigarette paper

In order to select a suitable extraction solution and efficiently extract saccharin sodium from paper, a SERS total content analysis experiment was conducted. The experimental values measured were compared with the true values measured by HPLC to evaluate the reliability of this method. In order to maximize the extraction of saccharin sodium from paper, optimization experiments were conducted on the extraction solvent for sample pretreatment. Water, ethyl acetate, 40% methanol aqueous solution and dichloromethane were selected as the extraction solvent of saccharin sodium (1.98 g/kg) in the paper.

Table S1 Chromatographic test conditions

Chromatographic conditions	Type/Parameter
Mobile phase	Acetonitrile and ammonium acetate
Flow rate	1.0 mL/min
Column	C18, 150 mm × 4.6 mm, 5 μm
Column temperature	30 °C
Detection wavelength	230 nm

Calculation of the content of sodium saccharin in the sample:

$$X = \frac{(C - C^{\circ}) \times V \times 1000}{M \times 1000}$$

X —Content of the analyte in the sample, g/kg.

C —Concentration of the analyte obtained from the standard curve, mg/mL.

C° —Concentration of the blank sample obtained from the standard curve, mg/mL.

V —Volume of the sample used for preparation, mL.

M —Mass of the sample, g.

Table S2 The Comparison of different solvents in extracting saccharin sodium from paper

Extraction solvent	Sample weight (g)	Solution detection concentration (mg/L)	Relative standard deviation (%)	Content of sodium saccharin in the paper (g/kg)	Recovery (%)
water	0.0505	10.7	0.2	2.1	104.1 %
ethyl acetate	0.0504	11.3	0.8	2.2	113.1 %
40% methanol aqueous solution	0.0511	12.0	0.1	2.4	119.6 %
dichloromethane	0.0504	2.1	0.3	0.4	21.2 %