Electronic Supplementary Material (ESI) for Nanoscale.
This journal is © The Royal Society of Chemistry 2016

Supporting Information

Nanomolar detection of Glucose using SERS substrates fabricated with Albumin coated gold nanoparticles.

Leonardo Perez-Mayen[1], Jorge Oliva[1], Pedro Salas[2] and Elder De la Rosa[1]*

[1]Centro de Investigaciones en Optica, A.P. 1-948, León, Gto. 37160 México

[2]Centro de Física Aplicada y Tecnología Avanzada, Universidad Nacional Autónoma de México, A.P. 1-1010, Querétaro, Qro. 76000, México

Calculation of total error for the parameters in table 1 (Column I).

The balance Sartorius, the Poseidon beta micropipette and the Labmate Soft LM100 micropipette were used to weigh and to prepare our solutions with glucose and albumin, the specifications for those instruments are:

Poseidon beta micropipette: volume range from 100μl to 1000μl, ISO 8655 validation and controls; V (100μL) accuracy (%): +-0.152, precision (%): 0.01; V (1000μL) accuracy (%): +-0.319, precision (%):+- 0.031.

Labmate Soft LM100 micropipette: volume range from 10μl to 100μl, ISO 8655 validation and controls; V (10μl) accuracy (%): -+1.600, precision (%): +-0.8; V (100uL) accuracy (%): -+0.800, precision (%): +-0.2.

Balance Sartorius CPA224S: Readability 0.1 mg, maximum weigh 200 gr.

Pyrex volumetric flask: 20 ml volume, precision: 0.04 ml (**+-0.2%)**

In order to determine the error for the amount of molecules and moles distributed on our SERS substrates (see column J in table 2 of manuscript), the following procedure was achieved:

Calculation of the error for weighing: We weighed 0.3604 gr (0.0020 moles) of glucose 10 times and we calculated the standard deviation (SD), the value for SD was **±0.4802%**

1. **Calculation of the error for volume:** We measured 10 times 1000 μl, 500 μl, 100 μl and 50 μl of tri-distilled water utilizing these micropipettes, and we weighed 10 times each one of these volumes of liquids. The values of SD were obtained using the differences of weight for these volumes of liquids taking into account that 1000 μl should weight 1 gr, 500 μl should weigh 0.5 gr, 100 μl should weight 0.1 gr and 50 μl should weigh 0.05 gr. Thus, the SD were **±0.012%,** ±0.0008%, ±0.014% and **±0.0278%** for the volumes of 1000 μl, 500 μl, 100 μl and 50 μl respectively.

2. The 0.0020 moles of dextrose were dissolved in 20 ml of water (this is named “main solution”) and we diluted that solution in water successively in order to get the final molar solution for each sample M1-M6, see table 2 in manuscript.

3. The total error for each sequential dilution was obtained with the formula: [(0.012+0,0278) * N + 0.2]= Volume error, where N corresponds to the number of times for which we used the micropipette to get each dilution from the “main solution”.

4. The total error was obtained by adding the error corresponding to the volume to the error of weight for the preparation of the “main solution”. The total error corresponding to each number of moles on the substrate is summarized in column D of table S1:

Table S1: Total error for each sample used for Raman detection

M1	**2**	**1.00E-05**	**0.76**
M2	**5**	**1.00E-08**	**0.88**
M3	**7**	**1.00E-10**	**0.96**
M4	**9**	**1.00E-12**	**1.04**
M5	**11**	**1.00E-14**	**1.12**
M6	**13**	**1.00E-16**	**1.20**