Supplementary information

Greener Approach towards the Development of Graphene-Ag Loaded ZnO Nanocomposites for Acetone Sensing Application

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SI- 1. The contents of medicinal powder:

Table S1: The adopted medicinal powder contents

Plant name	**Weight (g)**
Trachyspermum ammi	30
Piper nigrum	10
Sodii chloridum	10
Terminalia chebula	20
Carum carvi	15
Sodium bicarbonate	5
Ammonium chloride	5
Citrus medica	3
Ferula foetida	2

SI- 2. Details of thixotropic paste formation and thereby thick films:

The thixotropic paste was formulated by mixing the developed powder with a temporary binder (ethyl cellulose and butyl carbotyl acetate). The ratio of inorganic to organic part was kept at 70:30 vol ratio in formulating the paste. The paste was transferred to screen printing mesh and applied on alumina substrates using squeegee (Fig.S1). The as prepared thick films were dried at room temperature and then sintered at 400ºC for 1h in air to remove the binder content.

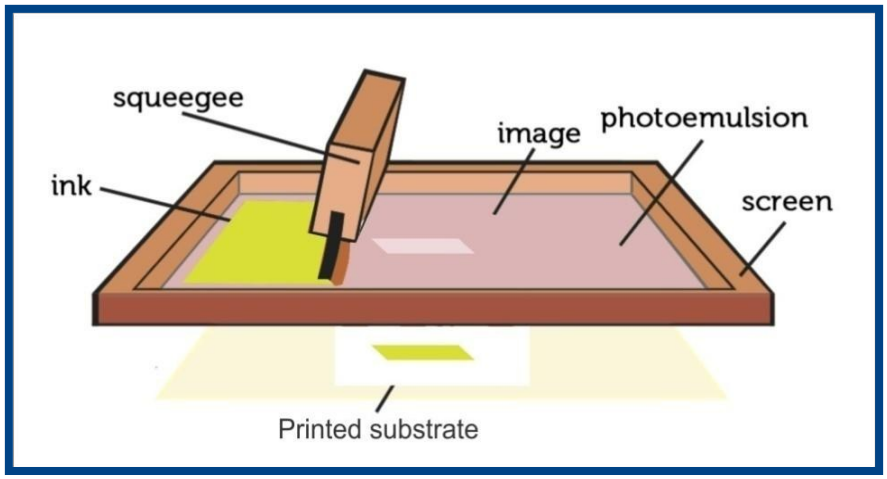

Fig S1: Schematic of screen printing technique

SI- 3. XRD reflections of the samples at various Ag doping:

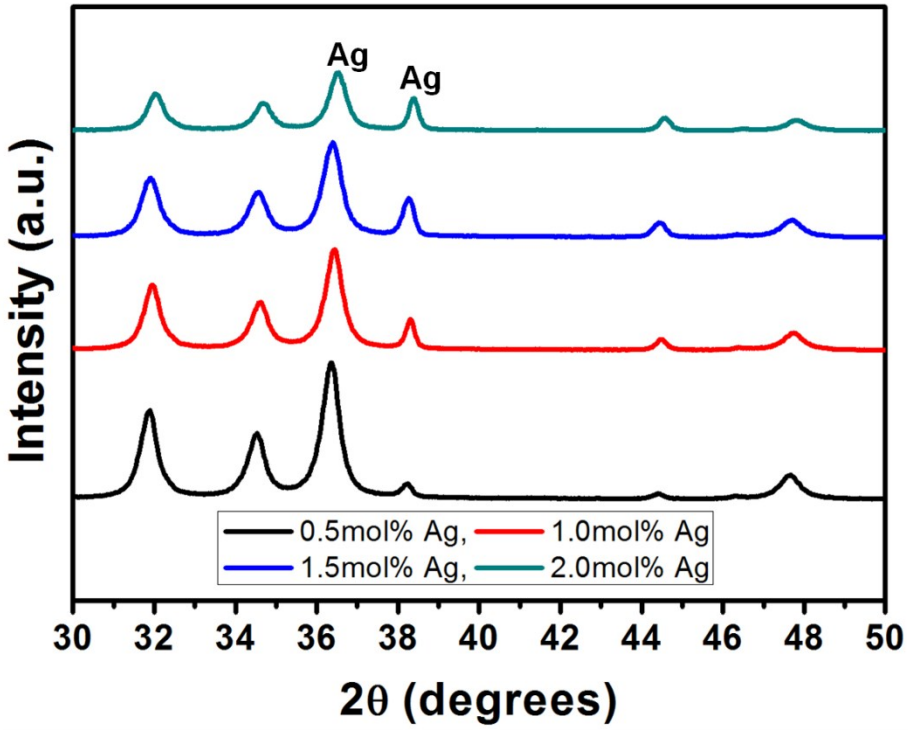

Fig S2: XRD reflections of the samples at various Ag doping

SI-4: N_2 absorption isotherms of Ag loaded samples:

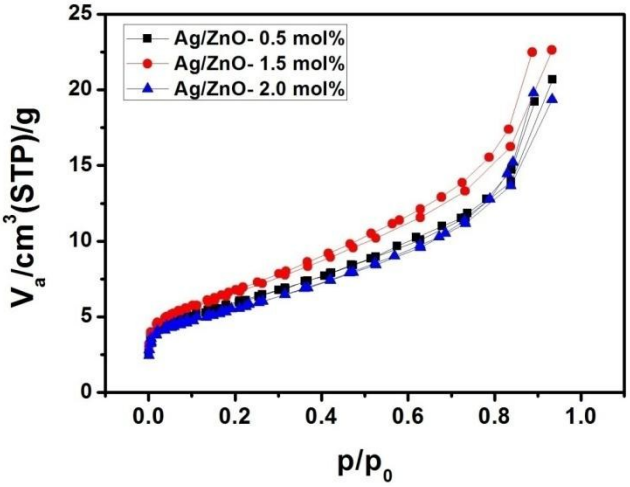

Fig S3: N_2 absorption isotherms of Ag loaded samples.

SI-5: The surface area and pore size values of developed samples

Table S1: The surface area and pore size values of developed samples.

Sample id	Avg. pore diameter (nm)	Surface area (m^2/g)	Pore volume (cm^3/g)
ZnO	6.2778	19.724	0.030956
ZA-0.5	6.1001	20.972	0.031983
ZA-1.0	5.7804	19.451	0.028108
ZA-1.5	6.0135	23.282	0.035002
ZA-2.0	6.1314	19.545	0.029960
ZA-1/GO	6.4873	23.981	0.038892

SI- 6 and 7: Elemental mapping of pristine ZnO and ZA-1/GO

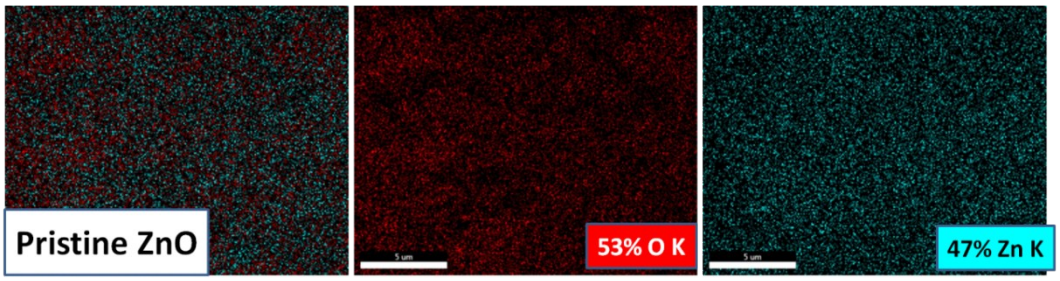

Fig S4: Elemental mapping of pristine ZnO.

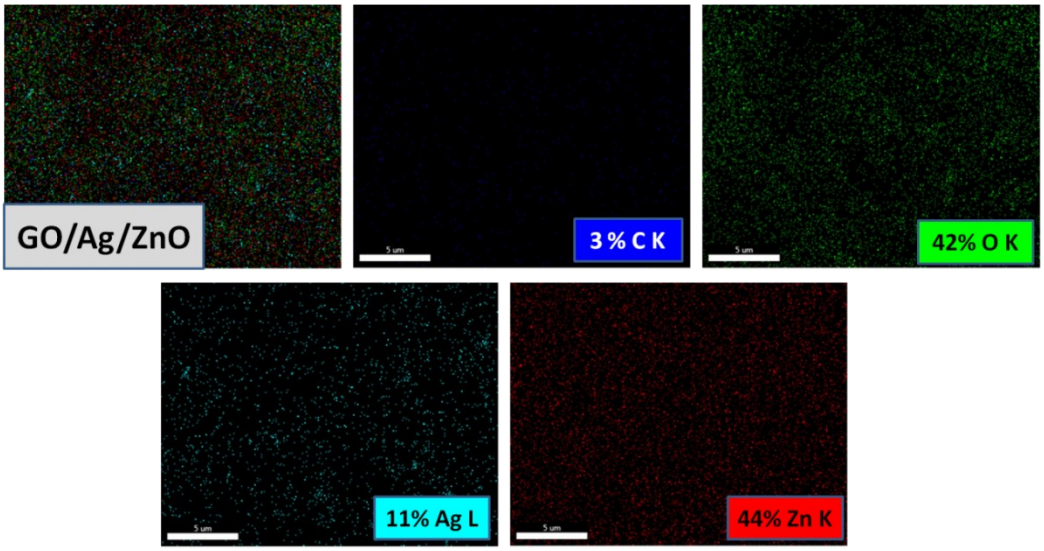

Fig S5: Elemental mapping of sample ZA-1/GO

SI- 8. TGA-DTA analysis:

Following Figure S6 illustrates the TGA–DTA plot of as synthesized sample Z6. The thermo-gravimetric curve shows three distinct weight losses as follows.

Stage 1: 8.5% (0.83 mg) from room temperature to 80°C,

Stage 2: 1.85% (1.64 mg) from 80°C to 160°C

Stage 3: 36% (2.63 mg) from 160°C to 400°C.

The first weight loss observed in TGA and the endothermic peak corresponding to 80°C in the DTA can be associated with the decomposition of physisorbed water molecules. The peak at 160°C is attributed to the decomposition of –OH groups and the non-bonded oxygen condensation. The proper oxide phase formation might have been completed at 400°C. Hereafter, no considerable weight loss was detected.