

Synthesis of Zinc Oxide Nanostructures and Investigation of their Photocatalytic and Bactericidal Applications

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Table 1 Preliminary phytochemical investigation of aqueous leaf extract of *Dolichos lablab* L.

S. No.	Test	Chemical Constituents	Result
1	Mayer's test	Alkaloid	+
2	FeCl ₃ solution	Phenol	+
3	NaOH	Flavonoid	+
4	Fehling solution	Carbohydrate	-
5	Conc. HNO ₃	Amino acid and protein	+
6	Methanol, chloroform, H ₂ SO ₄	Terpenoid	+
7	Shake with water	Saponin	+

Where, (+) indicates presence and (-) indicates absence

Table 2 Structure and geometric parameters of ZnO nanostructures

2θ (degree)	FWHM (β)	d-spacing (Å)	Cos θ	Crystallite size (nm)
8.3932	1.3056	10.52625	0.99732	6.38
31.8365	0.4080	2.80859	0.96165	21.16
34.5150	0.2448	2.59651	0.95498	35.51
36.3340	0.1224	2.47059	0.95015	71.38
47.6293	0.5712	1.90772	0.91486	15.88
56.6423	0.0816	1.62369	0.88030	115.55
62.9124	0.2448	1.47610	0.85304	39.75
66.5366	0.5712	1.40422	0.83611	17.38
68.0506	0.4488	1.37662	0.82879	22.31
69.1192	0.6528	1.35792	0.82354	15.44
Average				36.07

Table 3 Zone of inhibition of ZnO nanostructures against pathogens

S. No.	Pathogens	Concentration of ZnO nanostructures (mg/ml)			Standard (Ciprofloxacin)	Control (DMSO)
		2.5	5.0	10.0	5 µg/ml	
1	<i>Bacillus pumilis</i>	12 mm	18 mm	15 mm	40 mm	NA
2	<i>Sphingonomas paucimobilis</i>	15 mm	20 mm	15 mm	40 mm	NA

Where, DMSO is Dimethyl sulfoxide and NA is Not available