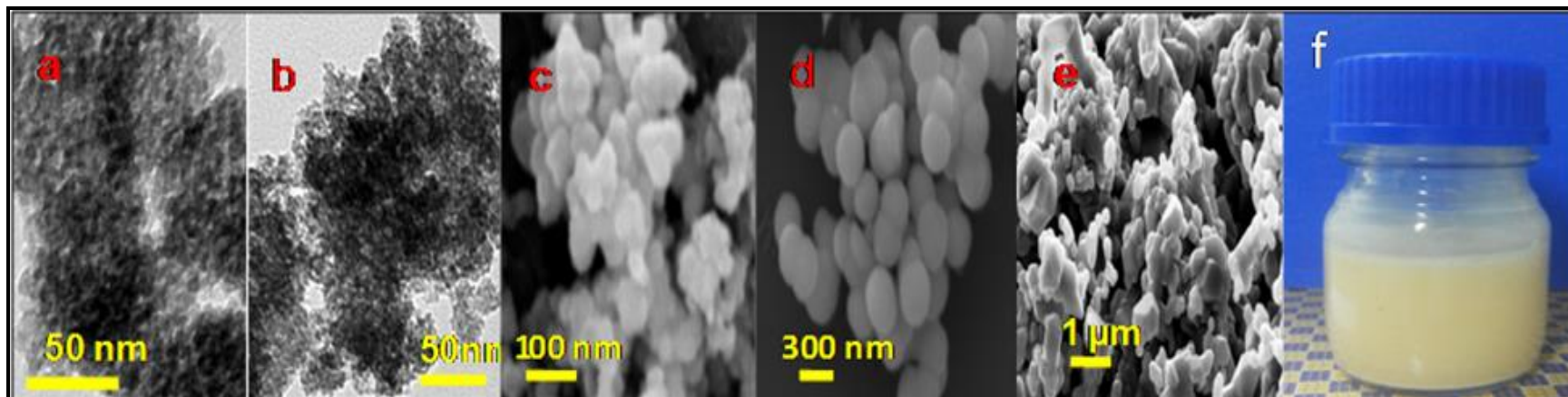




**Name of the Technology:** Process for the preparation of zinc peroxide nano-particles and its application for controlling spore germination in wheat (*Bipolaris sorokiniana*) and an antimicrobial agent and preparation thereof

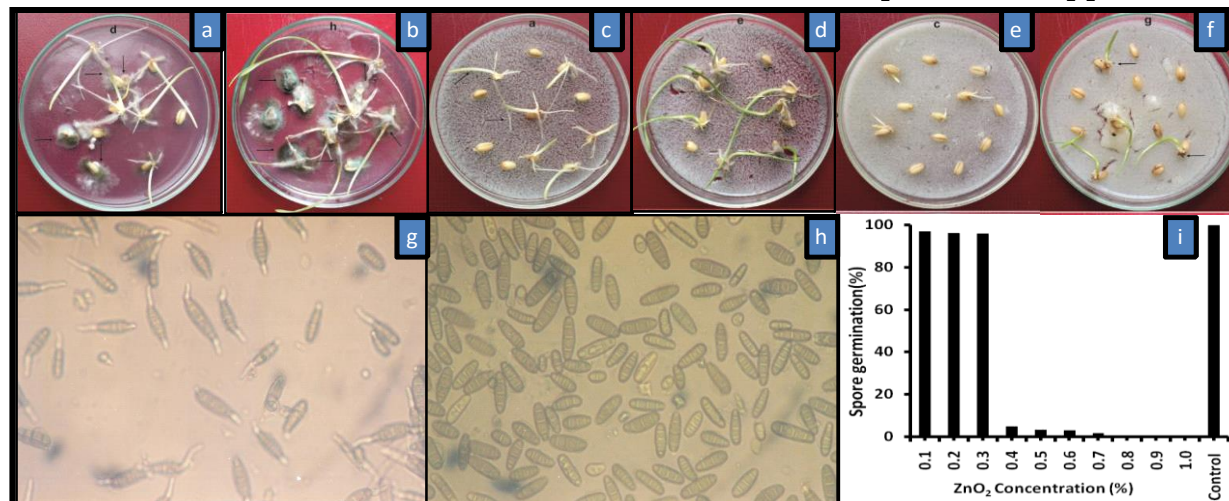


**Figure showing  $ZnO_2$  particles (a-e) of varying sizes; f:  $ZnO_2$  in liquid form**

**Summary:** Synthesis of nonmaterial of desired size and indifferent medium is a very challenging task. The proposed material of desired size has been synthesized in solvent and water based matrix. We have utilized this material for water purification especially for arsenic, chromium, cyanide, pesticides and microbes removal from contaminated water. The material can be synthesized as per the requirement of industry. The synthesis process is low cost, eco friendly.

**Applications:** water purification contaminated by arsenic, chromium, cyanide, pesticides and microbes, agriculture production etc

**Figure** showing effect of the different concentration of PVP functionalized ZnO<sub>2</sub> nanoparticles supplemented in water agar medium on wheat germination, its quality and mycoflora associated with wheat seeds. (a) & (b) germination of seeds and fungal growth after six and ten days of incubation without ZnO<sub>2</sub>, (c) & (d), germination of seed after 6 and 10 days with 0.5% concentration of ZnO<sub>2</sub> without growth of associated fungi, (e) & (f), indicates delayed germination without fungal growth and poor development of roots. (g) 100% spore germination of *B. sorokiniana* without ZnO<sub>2</sub> treatment of seeds, (h) complete spore germination inhibition after treatment with 10,000 mgL<sup>-1</sup> concentration of ZnO<sub>2</sub>; (i) bar diagram representing effect of the different concentrations of ZnO<sub>2</sub> on spore germination.



**Figure: Field experiments to enhance crop production (a) Mustard and (b) Wheat**



**Advantages:** Low cost, highly effective, environment friendly

**Choose the Readiness level of the Technology:**

Idea	Concept Definition	Proof of Concept	Prototype	Lab Validation	Technology Development	Technology Demonstration	Technology Integrated	Market Launch

**Related Patents:** FP05990/DKT: 8,715,612 (USA); FP04773/PC: 2011/31-10-2012 (South Africa); FP04774/PC: 2012 (Bangladesh); FP04774/PC: awaiting (India);; 049NF2014; 24/02/14

**Country:** USA, South Africa, Bangladesh and India; Publication Date: 2008-09; Grant Date: 2012-13

**Broad Area/Category:** Nanomaterial

**User Industries:** Water purification industries, Paint, cement, wall putty, agriculture

**For further details please contact:**

Head, Industrial Liaison Group (ILG)  
Room No. 46-A, Main Building  
CSIR-National Physical Laboratory  
Dr. K.S. Krishnan Marg  
New Delhi 110012, INDIA.

**Email:** [headilg@nplindia.org](mailto:headilg@nplindia.org)

Tel: +91-11-4560-8350/8247/9385

Fax: +91-11-4560-9310