

## **SOLUTION PLASMA NANOSYNTHESIS AND CHARACTERIZATIONS OF ZNO DEPOSITED ON BACTERIAL CELLULOSE NANOFIBERS**

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### **Abstract**

Nanotechnology is essential active field for development properties of materials such as morphology and particles size of inorganic synthesis. One of the green nanotechnology has emerged to synthesize various inorganic materials in nanoscale that is solution plasma process because this technique provides less chemical wastes in reaction as well as shows high potential for yielding metals nanoparticles. Recently, nano-ZnO has been known as strong antibacterial activities inorganic materials and widely used against various microorganisms. Bacterial cellulose (BC) is bio-nanofibers produced via biosynthesis pathway in *Acetobacter xylinum* (strain TISTR 975). The morphology of BC is three-dimensional non-woven network structure having appreciable mechanical properties. Hence, BC is an eco-friendly porous material that would be challenged as nanomaterial supported nano-sized ZnO particles. In this study, ZnO was synthesized via solution plasma process and deposited to the BC nanofibers. Furthermore, ZnO-deposited BC nanocomposites were characterized by using SEM, ATR-FTIR, XRD, XPS, and TGA. The antibacterial activities of the ZnO-deposited BC were also investigated against *Escherichia coli* and *Staphylococcus aureus*.

**Keywords:** Bacterial Cellulose, Nanosynthesis, Zinc Oxide

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