

Method for the Synthesis of a Zinc Oxide Graphene Composite Material

Market and Background

Zinc oxide graphene composite materials have significant interest commercially as they have been demonstrated effective for use in sensors and capacitors. They can act as transparent conductive thin-films and can possess photocatalytic activity. Furthermore, the non-toxic and low-cost features of these composite materials increase their desirability for use in these applications and more.

Synthesis of zinc oxide graphene composite materials has occurred via a range of experimental methods. Some methods have used electrodeposition and others have focused on solution-based synthesis that involved pH manipulation of a zinc ion precursor. The most common methods of synthesis include either solvothermal or sol-gel techniques. However, these more commonly used methods are not without their own drawbacks. These methods can require expensive precursor compounds, use harsh reactants, require skilled methodology, and can ultimately still result in final products that contain impurities. A truly safe, inexpensive, and simple method is needed for the synthesis of a high purity zinc oxide graphene composite material.

Research and Development Status and Commercialization Needs

Researchers at the University of Wisconsin – La Crosse have developed a method for the synthesis of a zinc oxide graphene composite material that is in fact simple, safe, and of low-cost. Through thermal decomposition of zinc oxalate in a homogeneous solid-state solution with graphene, the resulting material is a zinc oxide graphene hybrid that demonstrates high stability and the potential for use in commercially relevant applications. The researchers have already successfully fabricated thin-films from the composite material and experiments are ongoing to explore the structural, optical, and electrical properties of these films. Additionally, experiments are underway to explore the antibacterial and antiviral activity of these thin-films for use in high touch surfaces and food packaging.

WiSys is seeking a strategic partner interested in providing a route to market for the commercialization and use of this method for the synthesis of a zinc oxide graphene composite material. There is also interest in identifying an industry partner for the continued testing and commercialization of the ZnO/graphene thin-films developed from this method.

Applications and Key Benefits

- Simple method for the synthesis of a zinc oxide graphene composite material
- Low-cost materials used during synthesis
- Safely designed so no harsh chemicals or solvents are required during synthesis
- No requirement of high-cost specialized equipment
- Ratio of ZnO to graphene can be adjusted in this method of synthesis
- Composite material can be fabricated into thin-films
- Composite material expected to have use in sensors, capacitors, electronic devices, and other commercial applications

Intellectual Property

A PCT application has been filed for this technology. For more information, please contact WiSys at licensing@wisys.org.