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Technology Briefing & Scouting Report on "White Graphene": Industrial Applications and Recent Research related to Hexagonal Boron Nitride and Boron Nitride Nanotubes

TEM image of perfect hexagonal structure
Image courtesy of Graphene 3D Lab

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By Del Stark

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Introduction:

This report highlights recent academic research papers published in 2015 and early 2016 that could be of interest to companies interested in using hexagonal boron nitride and boron nitride nanotubes for applications including heat dissipation, the construction of novel devices, coatings, antifouling, reinforcement and ceramics. Links to paper abstracts are included.

120 research projects are reviewed in this report related to hexagonal boron nitride and the areas with the highest amount of publications are production and synthesis, devices and structures and transistors, Heat Dissipation / Thermal Conductivity, Coatings, Reinforcement, Antifouling, Ceramic, and Batteries.

A patent search was conducted to determine what research is being commercialised and what applications are being considered in industry. 93 patents are profiled in this report dealing with hexagonal boron nitride and are related to heat dissipation, production methods and devices and structures.

There are a variety of patents linked to hexagonal boron nitride and many applications and inventions. Also 12 research projects are reviewed in this report related to hexagonal boron nanotubes. These papers investigate aspects such as synthesis and modelling.

The areas of research and patents covered in this report are related to:

- Antifouling
- Battery
- Bioanalysis
- Ceramics
- CO_2 Capture
- Coatings
- Cosmetics
- Devices and Structures and Transistors
- Electrocatalyst
- Flame Retardancy
- Health Related
- Heat Dissipation / Thermal Conductivity
- Hydrogen Storage
- Insulation
- LED
- Lubrication / Anti Wear
- Metamaterials
- Polymers
- Production and Synthesis
- Reinforcement
- Super Capacitor
- Surface Treatments
- Transparency

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A patent search was conducted to determine what research is being commercialised and what applications are being considered in industry. 93 patents are profiled in this report dealing with hexagonal boron nitride and are related to heat dissipation, production methods and devices and structures.

Experts were asked for their views on the commercial viability of hexagonal boron nitride and if the material could replace graphene. Our findings from this research are presented in this report. The experts agree that hexagonal boron nitride is an exciting material for the future and will likely find applications as a counterpart to graphene.

Market data and company profiles of 33 companies are also included.