

# Graphene-Based Organic-Inorganic Hybrid Materials and Separation of Racemic Mixtures

Nikolai Kalugin, Ph.D, Chair/Associate Professor

Materials and Metallurgical Engineering, New Mexico Tech

I  
N  
N  
O  
V  
A  
T  
E  
  
N  
E  
W  
  
M  
E  
X  
I  
C  
O

## Background

Previously, it has been shown that modified carbon nanotubes and graphite can be used for further synthesis of different chiral organic molecules, or for separation of enantiomers. Currently, the major drawbacks of these systems include: high price of final hybrid, low density of organic molecules (per gram of final material), and weak interaction of organic molecule with carbon support. There is a present market need for materials that will address these drawbacks while maintaining effectiveness.

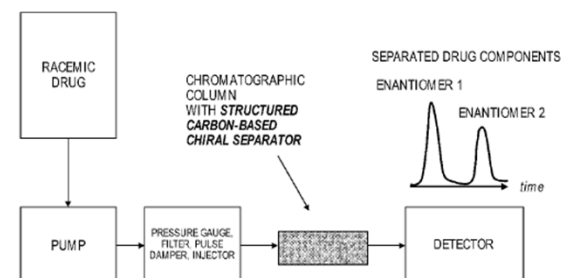
## Innovation

A method of making graphene-based inorganic-organic hybrid materials for application in fine organic synthesis and separation of enantiomers. These synthesized hybrid materials can be created in multi-step reactions which involve preparation of graphene-based materials, with controlled morphology and chemical composition, followed by modification of graphene-based materials by organic molecules. The targeted applications for these materials are in pharmacy, fine organic synthesis, and separation of chiral compounds.

Published Patent Application WO/2016/054129

4129 A1

(54) Title: GRAPHENE-BASED INORGANIC-ORGANIC HYBRID MATERIALS AND SEPARATION OF RACEMIC MIXTURES



## Contact

Nikolai Kalugin, Ph.D.  
Chair/Associate Professor  
Materials and Metallurgical Engineering  
New Mexico Institute of Mining and Technology  
(575) 835-6508  
[nikolai.kalugin@nmt.edu](mailto:nikolai.kalugin@nmt.edu)