Non-Confidential Description

Chromophore and Polymer Capable Of Detecting the Presence of Various Neurotoxins

Technology Case: RFT-161

Invention Summary

This NDSU-developed invention is a dual-use technology that was initially reported under the spin electronics program funded by Department of Defense. The "spintronics" polymer is being tested for use in applications such as increased electronic or computer memory. However, this same material was also used by NDSU in sensor tests. The material provides an optical alert when it comes in contact with metallic poison such as insecticides that are in the same family as nerve gas and neurotoxins.

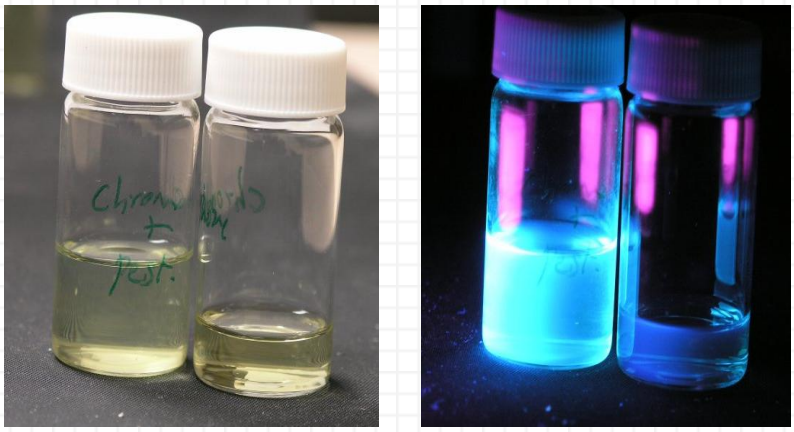

Figure 1: The image on the left shows two vials of the NDSU compound under white light, one containing a poison and one containing a "clean" liquid. The image on the right shows the same liquids when viewed under ultraviolet light. The liquid containing the poison and the sensing compound fluoresces, indicating the presence of a poison.

Benefits

- **GREEN TECHNOLOGY!** Detects hazardous substances harmful to the environment, including neurotoxins, dangerous metals, organic poisons, pesticides, and some bio-toxins.
- Reliably reports the presence of poison and toxins by visual and electronic signals
- Enhances current field sensing operation with added portability, simplicity, and sensitivity
- Immediate commercial applications in the areas of security operations, industrial safety, personal safety, health care, food processing, and food packaging

Invention Premise

When the detection compound of the invention comes in contact with the substance to be detected, the detection compound reacts with the substance, thereby changing its fluorescence properties. Because of this change in fluorescence, the detection compound can be used in a variety of sensors, including optical electrical sensors, bio-sensors, and surface acoustic wave sensors for the detection of various organophosphates and other hazardous materials.

Patents

This technology is patent pending with both US and PCT patent applications and is immediately available for licensing/partnering opportunities

Lead Inventor

Philip Boudjouk, PH. D.
VP for Research, Creative Activities and Technology Transfer

Dr. Philip Boudjouk was named NDSU's first Vice President for Research, Creative Activities and Technology Transfer in March 2000. Boudjouk has been active as a teacher, researcher, and member of the NDSU Department of Chemistry faculty since 1973. He earned his bachelor's degree at St. John's University, Jamaica, N.Y., and his doctorate in chemistry from the University of Wisconsin-Madison. Prior to his appointment at NDSU, he held a Teaching and Research Fellowship at the University of California at Davis for two years. During his tenure as Vice President, research expenditures at NDSU have increased from $44 million to $115 million.

Boudjouk's research career has focused on organometallic chemistry with emphases on organosilicon compounds, polymers, catalysis, materials research, and sonochemistry. He has more than 130 refereed publications in international journals and holds 19 patents. He has been the thesis advisor for 20 Ph. D. students and 22 M.S. students. Boudjouk has been a guest lecturer at over 40 universities in Europe and Asia.

From 1992-2000, Boudjouk served as Project Director for the North Dakota Experimental Program to Stimulate Competitive Research (ND EPSCoR). The ND EPSCoR program is widely recognized for its success in promoting and administering millions of dollars in federal contracts with research faculty throughout the North Dakota University System.

He has received numerous awards for teaching and research, including being named the Chamber of Commerce Distinguished Professor (1985) and University Faculty Lecturer (1985). He received the first annual Research Award from the College of Science and Mathematics (1992) and in 1998 he was named the Jordan A. Engberg Scholar, the first endowed professorship at NDSU.

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