

Intel International Science & Engineering Fair 2012 Pittsburgh, USA

Intel ISEF ABSTRACT & CERTIFICATION

Title: Electrical Conducting Insulator
 Finalist's name: Wai Tsun Hong, Yuen Kin Hong, Lui Yat Man Edmond
 School name: King's College

Start Typing the Body of your Abstract Here Beginning at the Left Margin

Inspired by the Nobel Prize in Chemistry 2000, we tried to investigate into conducting polymers. Among them, we chose polyaniline because of its wide range of potential applications.

In the project, we investigated into synthesizing polyaniline of different conductivity and the effect of acid or alkali on it. We found that small molecular size of polyaniline results in higher conductivity, and size of molecules is dependent on the environment during the synthesis. It is found that high temperature, absence of stirring and one pot addition of reagents result in smaller molecules.

Furthermore, we investigated the effect of acidity on the conductivity of polyaniline. The conductivity of polyaniline increases in acidic medium while it decreases in alkaline medium. We made use of this property to invent three generations of gas sensors. The first one is a stationary one for detecting harmful gases in factories. The second one is a mobile gas sensor. The final generation is a multi-detecting gas sensor that makes use of an electronics prototyping platform to show the results and connect to safety systems like alarms and rolling doors.

Category

Pick one only—mark and "X" in box at right

Animal Science

Behavioral and Social

Science

Biochemistry

Cellular & Molecular

Biology

Chemistry

Computer Science

Earth Science

Eng.: Materials &

Bioengineering

Eng.: Electrical &

Mechanical

Energy &

Transportation

Environmental

Analysis

Environmental

Management

Mathematical

Science

Medicine & Health

Microbiology

Physic & Astronomy

Plant Science

1. As a part of this research project, the student directly handled, manipulated, or interacted with (tick all that apply):

human subjects potentially hazardous biological agents


vertebrate animals microorganisms tissue

2. Student independently performed all procedures as outlined in this abstract. yes no

3. A Regulated Research Institution (e.g. university) was a work site for some or all of this project. yes no

4. This project is a continuation. yes no

I/We hereby certify that the above statements are correct and the information provided in the Abstract is the result of one year's research. I/We also attest that the above properly reflects my/our own work.


 Finalist or Team Leader Signature

27 Oct 2011
 Date