

2010 : April 2010 - Fast Breaking Papers : Andrew B. Holmes on Conjugated Polymers For Light Emitting Devices

Fast Breaking Papers - 2010

April 2010



Andrew B. Holmes talks with *ScienceWatch.com* and answers a few questions about this month's Fast Breaking Paper in the field of Chemistry.



Article Title: Synthesis of Light-Emitting Conjugated Polymers for Applications in Electroluminescent Devices

Authors: Grimsdale, AC; Chan, KL; Martin, RE; Jokisz, PG; Holmes, AB
Journal: CHEM REV, Volume: 109, Issue: 3, Page: 897-1091, Year: MAR 2009

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(addresses have been truncated.)

SW: Why do you think your paper is highly cited?

This is a comprehensive follow-up to our highly-cited review in *Angewandte Chem* published in 1998.

SW: Does it describe a new discovery, methodology, or synthesis of knowledge?

It simply attempts to be comprehensive in the field of synthesis and properties of conjugated polymers for light-emitting devices, including solid state lighting and flat panel displays.

SW: Would you summarize the significance of your paper in layman's terms?

If a thin film of fluorescent conjugated polymer is sandwiched between charged electrodes, one of which is transparent, application of a bias voltage across the electrodes causes fluorescence, resulting from charge recombination in the film as a result of the double charge injection process.

SW: How did you become involved in this research, and were there any problems along the way?

Our team at Cambridge formed the Chemistry component of a joint Physics-Chemistry collaboration that started in 1989 and led to the discovery of light-emitting polymers in 1990.

SW: Where do you see your research leading in the future?

If one can inject electric charge into fluorescent polymers and obtain light out from the charge injection

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process it should be possible to reverse the process and use the materials to capture (sun)light and generate electricity.

This should form the basis of a large-area low-cost flexible solar cells industry. Many people are already working on this idea around the world.

SW: Do you foresee any social or political implications for your research?

If significant cost reductions can be realized and device lifetimes increased, then this technology could play a very important role in the efforts to switch to renewable energy sources.

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KEYWORDS: LANGMUIR-BLODGETT-FILMS; HEAD-TO-TAIL; POLY(P-PHENYLENE VINYLENE) DERIVATIVES; HIGH-MOLECULAR-WEIGHT; STRUCTURE-PROPERTY RELATIONSHIPS; P-PHENYLENE-VINYLENE; CHEMICAL-VAPOR-DEPOSITION; ELECTRON-TRANSPORT MATERIALS; LIQUID-CRYSTALLINE POLYMERS; FLUORENE-BASED COPOLYMERS.



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