

Proposed Project 1

Charge mobility of organic semiconductors

Background

The charge mobility of organic semiconductors requires to be increased to enable higher speed organic transistor circuits and more efficient light-emitting diodes and solar cells. Measurement of charge mobility is a challenge in that a number of test methods are used, however agreement is poor and accurate models for extraction of the mobility values are poor.

Objectives

The activity in the project will include preparation of suitable test samples and devices, plus application of measurements and comparison of measurement uncertainties and mobility results

Standardization Needs

There are no known existing standards for charge mobility measurement in organic semiconductors. IEEE 1620 exists, however this does not currently specifically deal with charge mobility determination.

Some of the measurement methods

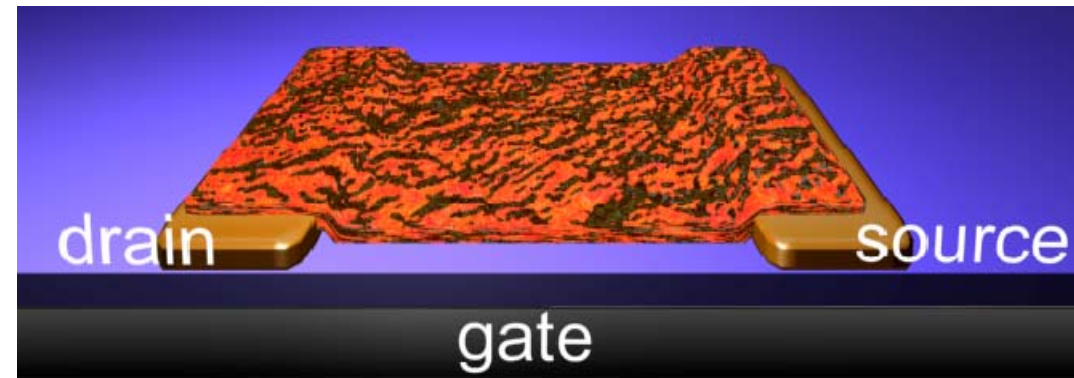
under consideration have wide industrial usage, but will require specific modifications or procedures for application to organic electronics. Other measurements have been developed particularly for organic electronics, being directly relevant to the unique properties of organic electronic materials and devices.

The current level of usage for the measurements under consideration is high, given the large volume of research and development work worldwide on organic electronics, both in academic and industrial organisations.

Work Programme

Measurements and related procedures for determination of charge mobility will be developed to include:

- Time Of Flight (TOF)
- Dark Injection Transient Spectroscopy (DITS)
- single-carrier diode devices (DC current-voltage [J-V])
- current extraction by linearly increasing voltage (CELIV)
- Field Effect Transistor configuration tests.



Deliverables and Dissemination

- reference methods
- reference data
- test procedures
- publications in scientific journals

These will be disseminated via standards bodies and trade organisations.

Deliverable 1:

Report on interlaboratory comparison of measurement methods for charge mobility of organic semiconductors.

Deliverable 2:

Recommended test procedures for measurement of charge mobility by DITS, DC JV, CELIV, TOF and FET.

**Call for Expressions
of Interest**

Funding

Participation is based on in-kind effort from the volunteers.

Project Status

Awaiting approval for start-up. Expressions of interest sought from interested participants.

For more information on participation, please contact:

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