**Electrochromic Smart Windows**

### About the Capability

Development of a new material, an organic electrochromic (EC) polymer, that is durable and can be processed at a lower cost than non-polymer EC materials.

### Key Features

- Tunable transparency/opacity and colours
- Energy-saving: able to block transmission of sunlight
- Durable: up to 10,000 cycles of ‘on-off’ switching
- Potentially lower processing cost compared with existing inorganic-based EC materials

### Potential Applications

- Smart windows
- Privacy windows
- Display windows

### Collaboration Opportunities

Work with industry, e.g. glass manufacturers to:
- scale up
- embark on large area material development and large-scale prototyping

### Technical Data

**UV−vis−NIR absorptions of polymer at various applied potentials**

<table>
<thead>
<tr>
<th>Potential</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0V</td>
<td>Yellow</td>
</tr>
<tr>
<td>1.2V</td>
<td>Light Green</td>
</tr>
<tr>
<td>1.5V</td>
<td>Light Blue</td>
</tr>
<tr>
<td>1.8V</td>
<td>Reddish brown</td>
</tr>
<tr>
<td>2.0V</td>
<td>Blue Black</td>
</tr>
</tbody>
</table>

**Cycle No. T (%)**

- Cycle No. 1: T = 28.6%
- Cycle No. 10: T = 25.7%

**Illustration shows the long-term ambient stability testing of EC-polymer device.**

**References:**


For more information, please contact:
industry@imre.a-star.edu.sg

IMRE website: https://www.a-star.edu.sg/imre/
A*STAR website: https://www.a-star.edu.sg/