Institute of Materials Research and Engineering
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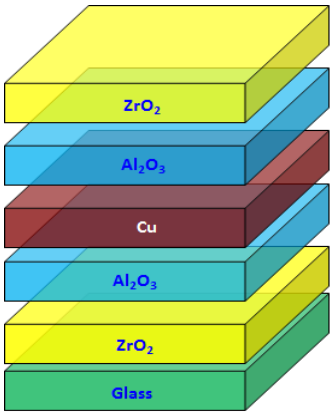
Transparent Heat Reflector

About the Capability

IMRE scientists developed a low cost transparent heat reflector (THR) for materials such as glass, plastic, and low temperature processing transparent substrates.

The team came up with a novel concept which involved the addition of a thin layer of metal oxide (Al_2O_3) and a film of zirconium oxide (ZrO_2).



A schematic diagram of the structure of the THR applied on glass. The structure includes copper (Cu) for heat reflection, zirconium oxide (ZrO_2) for adhesive, anti-reflection and anti-scratch properties and aluminum oxide (Al_2O_3) to act as an oxygen diffusion barrier and to enhance durability.

Key Features

- Low production cost due to low cost materials and the use of existing sputter based deposition technique
- Energy-saving: able to reduce heat transfer
- Highly durable
- Anti-reflective
- Scratch-resistant

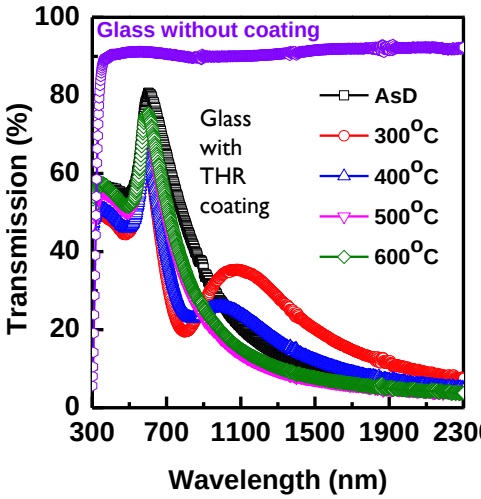
Potential Applications

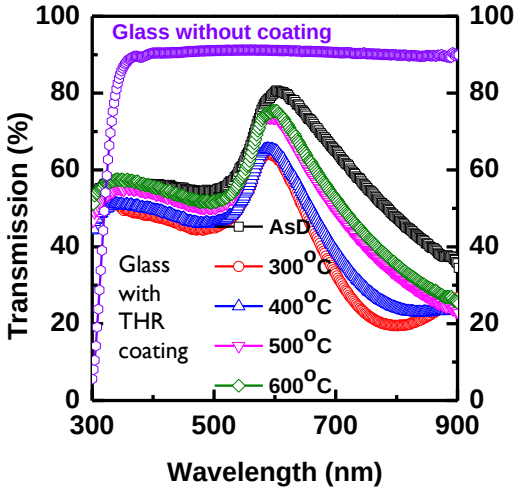
- Windows for 'green' buildings and automobiles

Collaboration Opportunities

- Working with industry, e.g. glass manufacturers , to scale up development of coating.

Performance Data





The transparency of the THR at 600nm is ~81% for As-deposited THR. After annealing at a temperature of 600°C, the transparency of the THR is changed only very slightly.

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