Metalized plastic: a material for a better world

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Global warming has been a matter of serious concern in recent years, and therefore, there is a need for lower carbon emissions in all human activities. In order to achieve this goal, new technologies are being developed. However, at present, a good amount of energy is being spent to get protection from the summer heat as well as the winter cold using appliances across the globe. Due to poor economic conditions, many people still cannot afford such appliances to live comfortably in these extreme climatic conditions. Additionally, those working directly under the sun during summer may even lose their lives due to sunstroke. Therefore, an easier and cheaper alternative method is described in this study for protection from the summer heat as well as the winter cold.

Keywords: Carbon emission, global warming, metalized polyester, solar radiation, summer heat, winter cold.

Experimental procedure

Metalized polyester sheets of thickness about 12 μm with metalization of around 20 nm were procured from Rolls Pack Pvt Ltd, Mumbai, India. Fe_2O_3 coating on the polyester side was done by air-drying the colloidal solution distributed uniformly over it. The adhesion of Fe_2O_3 on the polyester sheet was sufficient for this study. A maroon-coloured acrylic paint was manually coated on this metalized polyester sheet on both the polyester and metalized sides. A biscuit packet sheet was taken with a shining surface inside and a coloured printed surface outside. The metalized polyester pouch, which is usually used in food packaging, was procured from the local market.

Near infrared (NIR) and infrared (IR) reflections were tested in the laboratory using a 250 W IR lamp, keeping the sheets at different heights from the lamp. A laboratory thermometer was used to monitor the