

Title: Oxide layers deposited by the ALD method as heat-blocking coatings for windows

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Global warming is associated with rising levels of carbon dioxide in the atmosphere. We are currently witnessing global climate change, which threatens the continued existence of people on Earth. The mechanism of global warming is already well understood. We know that CO₂ is a greenhouse gas, and its higher concentration increases the absorption of infrared radiation and strengthens the greenhouse effect. Studies show that at the current concentration (above 400 ppm), the Earth's heating effect is enhanced by about 2 W/m² compared to pre-industrial levels. In order to survive, we must significantly reduce the consumption of energy from conventional sources (burning coal, gas or oil) and introduce "green" energy sources. One of the simplest solutions in this area is to improve the heat balance of our apartments through appropriate wall insulation, but above all through the use of the so-called. energy-saving windows (e-low) blocking overheating of flats in the summer and heat escape in the winter.

Windows are the weakest link in the work on thermal insulation of our apartments. Metal coatings (e.g. Ag) are currently used in e-low windows. They must be protected against oxidation by coating with thin foils or by a special construction of the windows - the metallic layer is the inner coating and the integrated glass is filled with an inert gas (among others, argon is used). This is an effective solution, but there are problems with the durability of metallic coatings (oxidation).

We propose and test a new solution of covering windows with transparent layers of conductive oxides. Already the first tests showed the great potential of this solution. Such coatings effectively block overheating of flats in summer and heat escape from rooms in winter. We propose and test a new solution of covering windows with transparent layers of conductive oxides. Already the first tests showed the great potential of this solution.