Advances in chromogenic materials and devices

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Abstract

Chromogenic materials allow the transmittance of visible light and solar energy to be varied under the action of an external stimulus. This paper first discusses buildings related energy savings that can be accomplished by chromogenic technologies, and their beneficial effects on comfort issues. We then summarize recent work on thermochromic VO_2-based thin films with particular attention to multi-layers of VO_2 and TiO_2 and to new VO_2:Mg films for which the doping gives significantly lowered absorption of visible light. The final part covers electrochromic materials and devices with foci on coloration efficiency and on durability issues for foil-type constructions based on films of WO_3 and NiO.

Keywords

Chromogenic material;
Electrochromism;
Thermochromism;
Vanadium dioxide;
Tungsten oxide;
Nickel oxide;
Optical properties;
Energy efficiency