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Organic-Inorganic Liquid Crystalline Composites PETR SHIBAEV, Department of Physics, Fordham University, New York — Design of novel liquid crystalline composites consisting of organic liquid crystals, metal oxides (titanium oxide, zinc oxide, etc.) and "interface" layer covering inorganic materials is presented and discussed. The composites respond to light irradiation by changing orientation of liquid crystalline molecules, resulting in the changes of transmission and reflection properties of cells made of composite materials. The interaction of composite materials with light results from a complex chain of physico-chemical processes inside both the inorganic component and the "interface" layer. The processes that play the major role in the re-orientation of liquid crystalline molecules in the surface layer include: i. light-induced formation of electron-donor pairs inside metal oxides, ii. energy transfer of electron excitations to molecules inside the "interface" layer, iii. breaking of hydrogen bonds and conformational changes of molecules inside the "interface" layer. The experimental study of the processes resulting in re-orientation of liquid crystals by light is accompanied by theoretical calculations of conformational changes inside the "interface" layer and molecular re-orientation on the surface of inorganic materials.

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