Photoswitching of the Optical and Electrical Properties of One-dimensional π-Electron Systems

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The photoswitching of the energy gap width of the isomeric forms of photoresponsive polymers with homonuclear photochromic diarylethene elementary units is investigated theoretically, taking into account the correlation correction. It is shown that a real switching of electrical conductivity (insulator $\Leftrightarrow$ semiconductor or conductor) can not be realized with polymers with alternant homonuclear π-electron systems within the elementary unit. A change and tuning-in of the light absorption is possible in most cases.

Key words: Photoswitching; Photoresponsive Polymers; Band Structure.