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Title:Transmittances of terahertz pulses through organic copper phthalocyanine films on si under optical carrier excitation

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Abstract:Transmittances of terahertz (THz) pulses through organic copper phthalocyanine (CuPc) films on Si were investigated under optical carrier excitation. As the external laser power increases, the difference between transmitted energies of THz pulses along the forward (CuPc/Si) and backward (Si/CuPc) directions increases. The transmitted energy in the backward direction is larger than six times that in the forward direction under a laser beam of 300 mW. The big difference between the transmitted energies was explained in terms of the density of photocarriers injected into the CuPc film and carrier transport characteristics correlated with the degree of disorder of CuPc molecules.

Number of references:22

Inspec controlled terms:carrier density - copper compounds - high-speed optical techniques - laser beam effects - organic semiconductors - photoconductivity - semiconductor thin films - terahertz wave spectra

Uncontrolled terms:terahertz pulse transmittance - organic copper phthalocyanine films - optical carrier excitation - external laser power - laser beam effects - photocarrier density - carrier transport characteristics - molecule disorder degree - photoconductivity - power 300 mW - Si

Inspec classification codes:A7847 Ultrafast optical measurements in condensed matter - A6180B Ultraviolet, visible and infrared radiation effects - A7240 Photoconduction and photovoltaic effects; photodielectric effects - A7360R Electrical properties of organic compounds and polymers (thin films/low-dimensional structures) - A7220F Low-field transport and mobility; piezoresistance (semiconductors/insulators) - A7865T Optical properties of organic compounds and polymers (thin films/low-dimensional structures) - A7870G Microwave and radiofrequency interactions with condensed matter - B2520M Other semiconductor materials

Numerical data indexing:power 3.0E-01 W

Chemical indexing:Si/sur Si/el

Treatment:Experimental (EXP)

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