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## Linear Optical Properties in Multilayers of Polydiacetylenes

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LINEAR OPTICAL PROPERTIES IN MULTILAYERS  
OF POLYDIACETYLENES

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Abstract. The linear optical properties in multilayers of polydiacetylenes (PDA) have been investigated by studying both the transmission/absorption coefficients and the waveguide properties of the thin PDA films ( $\sim 5000$  Å). The PDA films were deposited one monolayer at a time by the Langmuir Blodgett technique. The waveguide modes of the PDA waveguide (in an air - PDA film - silver configuration) were coupled via a grating at the air-PDA and/or PDA-Ag interface. Since the diacetylene chains are parallel to the interface, the TE wave/waveguide modes (i.e., the electronic field is parallel to the PDA film), the system can be treated simply as an isotropic case. For TM wave/waveguide modes, the system has to be treated as an anisotropic one. The results of wavelength dependent linear optical property of PDA films and their impact to the waveguide properties as well as the grating coupling effects in the waveguide system will be discussed.