

APPENDIX III

QUICK REFERENCE - CONTRIBUTED ABSTRACT FORM

- * 12 cm by 10.5 cm ($4\frac{3}{4}$ in. by $4\frac{1}{8}$ in.).
- * Submitted by an APS member - signature, name, and address in lower right
- * One primary paper per first author and one supplementary paper.
- * Note the deadline! APS not responsible for mailing delays.
- * Continuous text - no floating titles.
- * Indent before title.
- * Underline title.
- * Readable and printable.
- * Subject category upper right.
- * Name and date of Meeting center top.

Physics and Astronomy Classification Scheme Number 25.85	Abstract Submitted for the Ohio Section Meeting of the American Physical Society Fall, 1990	Suggested title of session in which paper should be placed <u>Optical Properties of Film Structures</u>
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One-dimensional Heterojunction Structures in Polysilylenes. N. MATSUMOTO, H. ISAKA, NTT Basic Research Labs. - - - UV absorption, luminescence and excitation spectra of poly (di-n-hexylsilane) solid films have been observed at temperatures from 4K to 400K. The UV spectrum, under the melting point (T_C), exhibits two peaks corresponding to a crystalline portion (365 nm at 4K: Phase I) and an amorphous fraction (319 nm at 4K: Phase II). The luminescence spectrum, on the other hand, has only one peak emitted from phase I. Two luminescence peaks (348 nm and 381 nm) can be observed only near T_C and there is only one luminescence peak from Phase II above T_C . When Phase I and Phase II form a one-dimensional heterojunction structure along a chain, as in the case of temperatures below T_C , electrons and holes excited in the wide-gap Phase II relax toward the narrow-gap Phase I and recombine radiatively. When two phases are spatially independent on the different chains, or when the third phase exists as a trap along a chain, the energy transfer between the two phases is disturbed. The former case corresponds to the above luminescence observation near T_C . The latter case has been confirmed by the observation of two-peak luminescence in rapidly cooled films with the third phase (UV peak: 350 nm)

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