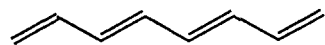
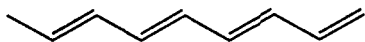


... applied to our results. It is found that this model is both ... Acknowledgment. Support from King Fahd University of

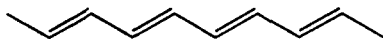
I



1,3,5,7-octatetraene

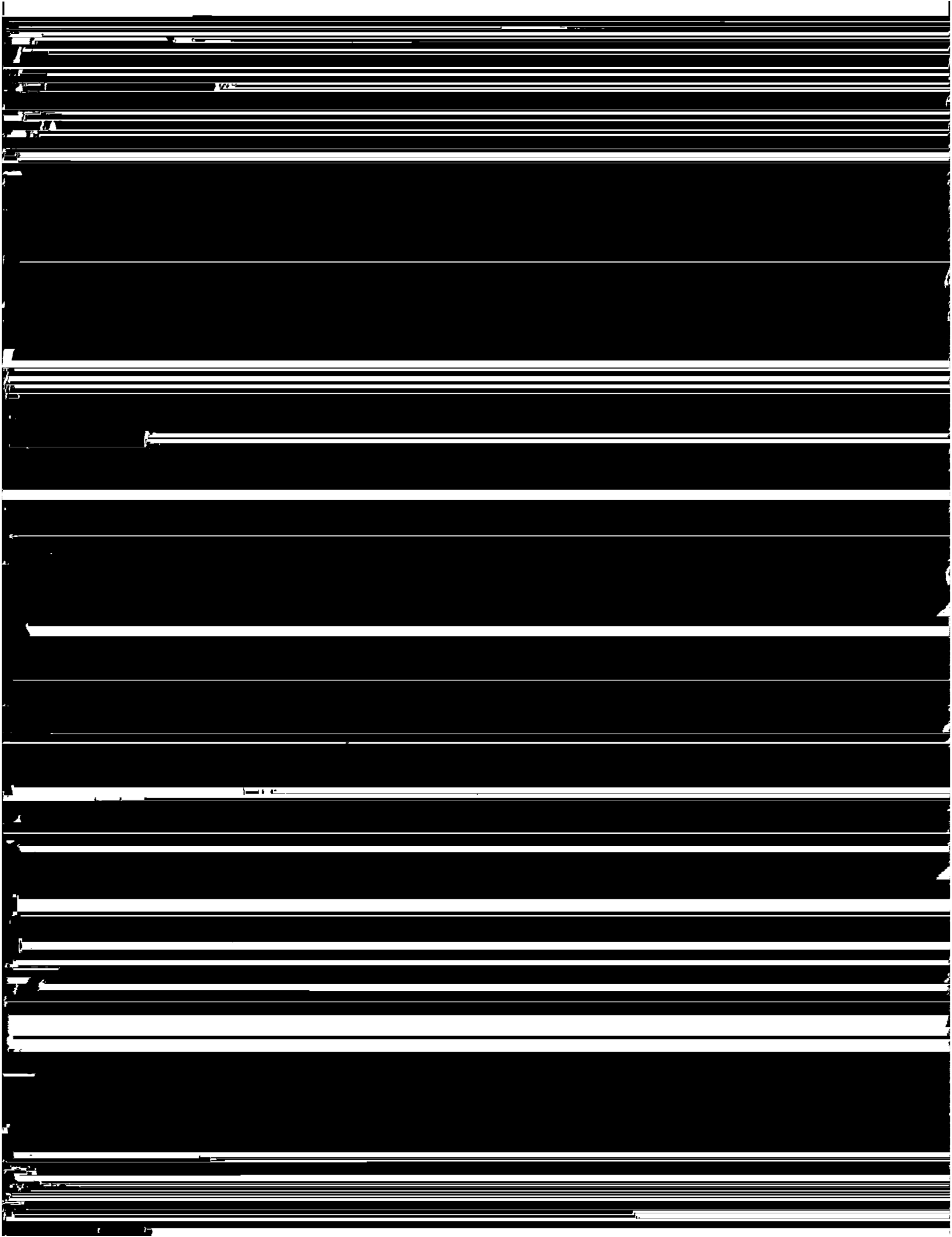


1,3,5,7-nonatetraene



between crotyltriphenylphosphonium bromide and octatrienal, which had been obtained from the acid-catalyzed self-condensation of crotonaldehyde.<sup>3</sup> All samples were purified by multiple recrystallizations. Ultraviolet spectra and HPLC analyses showed that these samples were dominated by all-trans isomers. Further details of the syntheses and purification of these and several other simple polyenes will be described separately.<sup>21</sup>

Absorption spectra of static vapor samples were measured on a Shimadzu UV240 spectrophotometer interfaced to a micro-computer. Fluorescence and fluorescence excitation spectra were obtained on a SPEX Model 212 spectrofluorimeter equipped with a SPEX DM1B data station. All spectra were corrected for the wavelength dependencies of optical components and then transferred to a main-frame computer for subsequent analysis and display. Comparison of corrected excitation and emission spectra of standard samples such as naphthalene and anthracene showed



**TABLE I: Band Positions and Bandwidths Observed in the  $1^1A_g \rightarrow 1^1B_u$  Fluorescence Excitation Spectrum of *all-trans*-2,4,6,8-Decatetraene**

freq, <sup>a</sup> cm <sup>-1</sup>	shift, <sup>b</sup> cm <sup>-1</sup>	bandwidth, <sup>c</sup> cm <sup>-1</sup>	height <sup>d</sup>	assignment <sup>e</sup>
34 780	(0)	22 (2)	100	0-0
34 916	132	24 (4)	20	
35 057	273		8	

*cis* isomer impurities in our samples. The  $S_1 \rightarrow S_0$  transition in *cis* polyenes is not symmetry forbidden and thus might be preferentially observed. However, there are several reasons why *cis*-decatetraenes cannot be implicated in our spectra: The room-temperature, static gas fluorescence excitation spectrum obtained by monitoring the broad  $S_1 \rightarrow S_0$  emission is identical with the excitation spectrum obtained by monitoring the  $S_2 \rightarrow S_0$  emission. Both of these spectra are in good agreement with

