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THE ABSORPTION AND FLUORESCENCE SPECTRA OF P-TERPHENYL IN TOLUE--ETC(U)

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NRL MEMORANDUM REPORT No. 8

THE ABSORPTION AND FLUORESCENCE SPECTRA
OF P-TERPHENYL IN TOLUENE

C. F. Ravillious
ELECTRICITY DIVISION

30 April 1952



NAVAL RESEARCH LABORATORY, WASHINGTON, D.C.

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by
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Electromagnetics Branch
Electricity Division
Naval Research Laboratory
Washington 25, D.C.

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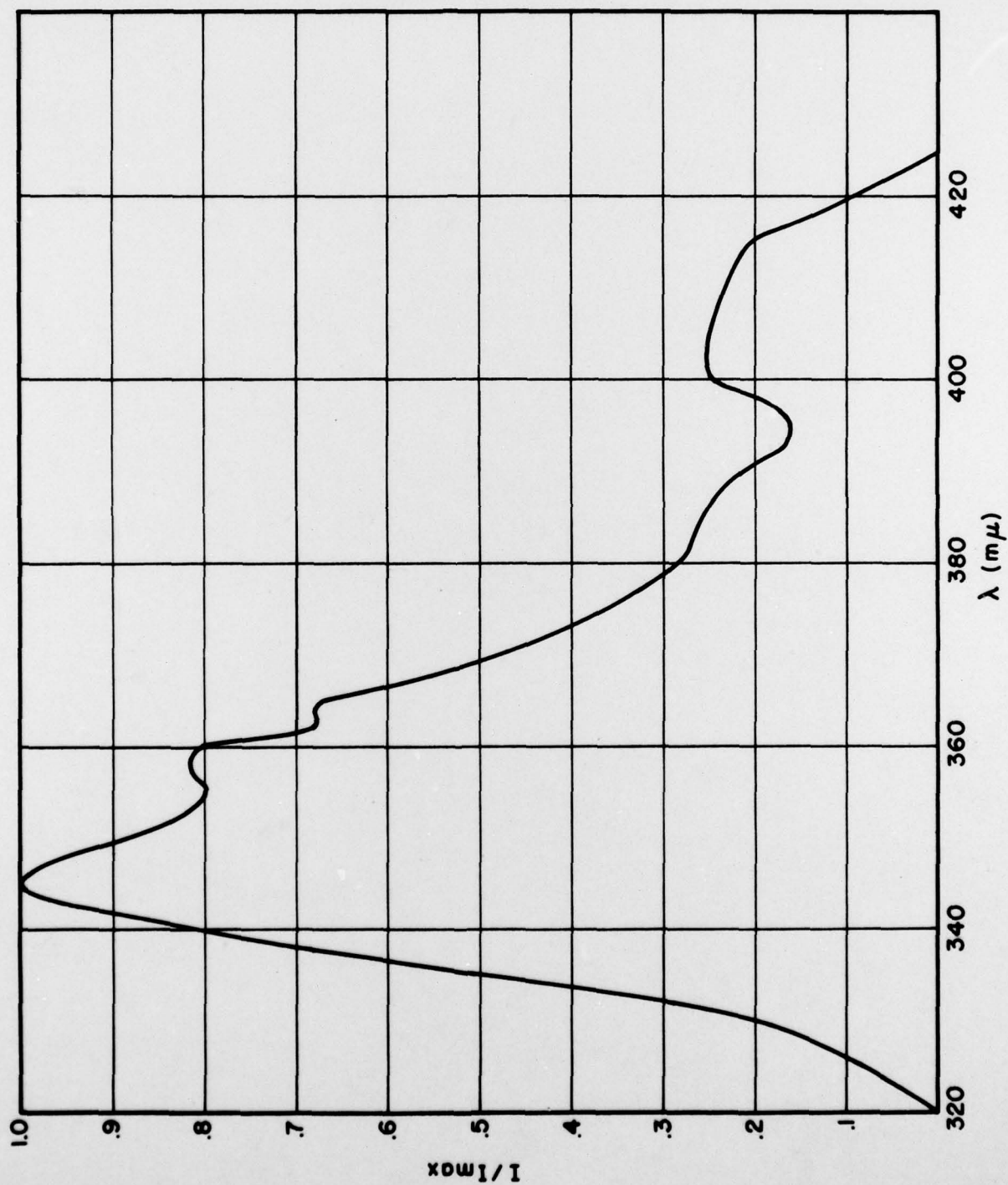
NRL Problem No. 33H14-01
RDB Project No. NR 464 010

The fluorescence spectrum of 1/2% p-terphenyl in toluene was obtained by means of a Hilger medium quartz spectrograph. The solution was contained in a 1 cm. thick quartz absorption cell taped over the spectrograph slit, and fluorescence was excited by a 40 mc. radium source placed next to the cell. The plate was exposed for 65 hours and the density measured by a Leeds and Northrup recording microdensitometer. The spectrum is given in Figure 1. Ordinates are the ratios of intensities to the maximum intensity, $I_{\text{max.}}$, at 345 m μ .

Absorption coefficients of the solution were measured by passing collimated light from a hydrogen lamp through each of two absorption cells of different lengths. The cells had quartz end windows selected to give the same reflection losses in the two tubes. The light transmitted by the terphenyl solution was focused on the slit of a Gaertner monochrometer, and the intensities at various wave-lengths were measured with a 1P28 photomultiplier tube at the exit slit. For wave-length λ the absorption coefficient is

$$a = \frac{1}{\Delta} \ln \frac{I_A}{I_B} \text{ cm.}^{-1}$$

where I_A and I_B are the intensities at the given wave-length transmitted by the short and long absorption cells respectively, and Δ is the difference in length of the cells. Figure 2 is the graph of a in the region of the fluorescence of 1/2% terphenyl in toluene.



FLUORESCENCE SPECTRUM OF 1/2 % TERPHENYL IN TOLUENE

FIG. 1

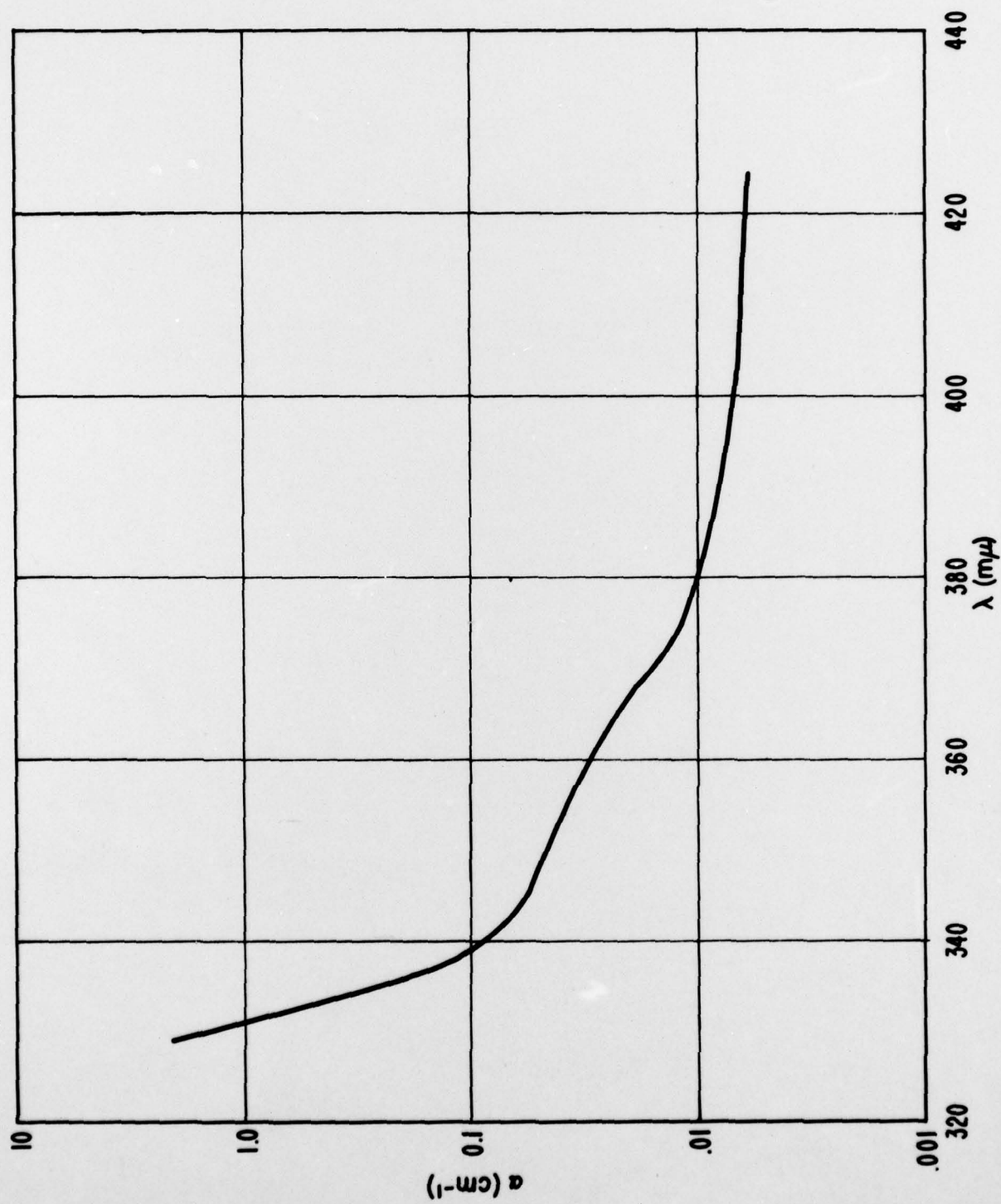


FIG. 2

ABSORPTION SPECTRUM OF 1/2% TERPHENYL IN TOLUENE