C. FLUORESCENCE SPECTRUM OF 1:2-BENZPYRENE.

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HIEGER [1930¹; Cook *et al.*, 1933] used the fluorescence spectra of various pitch fractions to aid in the isolation of 1:2-benzpyrene as the carcinogenic hydrocarbon contained therein. The low dispersion of his spectrograph permitted him to record only the three main bands. This work has therefore been repeated using a Hilger

Fig. 1. 1:2-Benzpyrene solutions (Cook's samples).
Exposure 1 hour (Panchromatic plate).

medium quartz spectrograph (dispersion of about 40 Å./mm. at 4000 Å.) and light from a mercury arc filtered through Wood's glass. Synthetic samples of 1:2-benzpyrene (from Prof. Cook and from Prof. Sannié) gave by visual observation of the photographic plates apparently identical results. A benzene solution of 1 mg./10 l. showed three main bands with short wave-length edges at approximately 4040, 4270 and 4540 Å. (Hieger's 4000, 4180 and 4400 Å. bands). These were seen to be multiple bands, and from a visual estimation the position of the maxima were at 4055, 4110, 4180, 4310, 4580, 4880, 5500 Å. There is thus good agreement with the microphotometered determinations of Sannié [1936] except for the weak band at 5500 Å. (Sannié, 5300 Å.).

We do not agree, however, that the effect of impurities on the fluorescence spectrum of 1:2-benzpyrene is as great as suggested by Sannié [1936]. Three samples of benzpyrene (1) isolated from pitch (Cook's sample X, m.p. 175.5-176.5°), (2) synthetic (Cook's pure sample, m.p. 176.5-177.5°) and (3) crude

¹ The 3680 Å. mercury line mentioned is really the strong 3650 Å. line.

synthetic (Cook's sample, m.p. 171–172°) gave under comparable conditions (1 mg./ml. benzene, 1 hour's exposure to u.v., identical Panchromatic plate) fluorescence bands which appear by visual estimation to be in the same positions (Fig. 1). There was no shift to longer wave-lengths of 50 Å. with elevation of the m.p. from 171–172° to 176.5–177.5°, and such a shift would be easily visible with the instrument used. Furthermore the addition of 1:2-benzanthracene to benzpyrene solution to the extent of 30 % by weight seems to have no effect on the positions of the band edges. It appears therefore from these experiments that the fluorescence spectrum can still be employed as a useful qualitative test for the presence of 1:2-benzpyrene.

REFERENCES.

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