ABSORPTION SPECTRUM OF LIQUID BENZENE: REPLY TO THE FOREGOING CRITICISM BY ELLIS

By James Barnes

SIX months earlier than Professor Ellis' abstract[1] I published with Mr. Fulweiler an article[2] in which we reported that we had photographed and measured two strong absorption bands of benzene at 8741A and 7134A and said that "no absorption was found at wave-lengths 0.835μ and 0.760μ." These latter bands were at that time an integral part of Ellis' anharmonic series due to the C—H group. No mention of our results is made in the above abstract by Ellis, although the values of the wave-length of two of the bands agree exactly with our values. It was the strong intensity of these bands, the accurate measurement of their wave-lengths, the elimination of bands at 0.834μ and 0.760μ and the measurement of the band at 6060A shortly afterwards, that gave us the clue to the series and which led us to extend our work in the region greater than 1μ.

I hold no brief for the assumption under criticism except that it seems to fit in with the data obtained. There is no violation of the idea in wave mechanics that the 1/2 term indicates an initial energy state of the oscillator and that quantum numbers, as used by Ellis, are integers.

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[1] Ellis, Phys. Rev. **31**, 310 (1928).
[2] Barnes and Fulweiler, Jour. Am. Chem. Soc. **49**, 2034 (1927).