BARRIERS TO METHYL GROUP ROTATION IN THE GROUND AND ELECTRONICALLY EXCITED STATES OF TOLUENE[a]

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The high resolution $S_1 \leftarrow S_0$ electronic spectrum of toluene has been recorded. The origin band exhibits two sub-spectra owing to the torsional motion of the attached methyl group. Analysis of these sub-spectra yields accurate values of the barriers to internal rotation in both electronic states. The S_0 and S_1 barriers are different. Additionally, they are different from previously determined values. Possible reasons for these observations will be discussed.

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