

V. NUCLEAR MAGNETIC RESONANCE AND HYPERFINE STRUCTURE

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A. HYPERFINE STRUCTURE OF THE 3P_1 STATE OF MERCURY BY DOUBLE-RESONANCE METHODS

Data were collected on the exact location of the even isotopes (isotope shift) to an accuracy of 1/100, which is in good agreement with previous measurements made with a "magnetic scanning" technique. The double-resonance method, which was used to separate the overlapping optical lines, especially in the case of Hg^{204} , has proved successful.

Also, a new calibration of the scanning magnet was obtained by proton resonance, up to fields of 7000 gauss, and a check of the spatial homogeneity was performed.

In concluding the measurements on the even isotopes, further measurements will be made to determine the hyperfine structure of Hg^{201} and Hg^{199} . They will yield the hyperfine structure between 3000-5000 gauss, which is the field corresponding to the microwave frequency (3100 mc) that was used.

Concurrently, radiofrequency equipment (50-144 mc) is being build for use with the same scanning magnet in order to determine the hyperfine structure of the odd isotopes at much lower fields (100-250 gauss).

We believe that these data will be sufficient to give a complete picture of the isotope shift and hyperfine structure within 1/100 of the 3P_1 state of natural mercury at zero field.

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