THE ROTATIONAL SPECTRUM OF LUTETIUM MONOXIDE, LuO ($X^2\Sigma^+$), PREPARED USING LASER ABLATION, MEASURED WITH A CAVITY PULSED JET FOURIER TRANSFORM SPECTROMETER[a]

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The N = 1 - 0 rotational transition of ^{175}Lu^{16}O ($X^2\Sigma^+$) has been measured for the ground and several excited vibrational states. The molecules were prepared by laser ablation of Lu metal in the presence of O_2, and stabilized in supersonic jets of Ar. The spectra were observed with a cavity pulsed jet Fourier transform microwave spectrometer. Detailed assignments have been made in terms of case $b_{\beta s}$ coupling, using the Zeeman patterns of the lines in the Earth's magnetic field. The equilibriuminternuclear distance r_e, the electron spin-rotation constant γ and several ^{175}Lu hyperfine constants have been precisely evaluated, and will be compared with earlier values and the results of quantum chemical calculations. The astrophysical relevance of the results will also be discussed.

[a]Work supported by the Natural Sciences and Engineering Research Council of Canada, the Petroleum Research Fund of the American Chemical Society (to S.A.C.) and the Berliner Programm zur Foerderung der Chancengleichheit fuer Frauen in Forschung und Lehre (to C.K.)