# LASER INDUCED FLUORESCENCE SPECTROSCOPY OF RHODIUM FLUORIDE

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Rhodium monofluoride has been observed and spectroscopically characterized for the first time. RhF molecules were produced under jet-cooled conditions in a laser vaporization molecular beam source by the reaction of a laser-vaporized rhodium plasma with $SF_6$ doped in helium, and studied with laser-induced fluorescence spectroscopy under both medium- and high-resolution. More than 25 LIF bands have been observed between 18 500 and 24 500 $cm^{-1}$ and five of these have been recorded at 200 MHz resolution. All bands of appreciable intensity have been rotationally analyzed. The ground electronic level has $\Omega = 2$, which is attributed to an inverted $^3\Pi$ state from the $2\delta^4 12\sigma^1 6\pi^3$ electron configuration. The ground level rotational constants are $B$ = 0.27245 $cm^{-1}$, $D$ = 1.035x10$^{-7}$ $cm^{-1}$. Very small ground level $\Lambda$ - doublings are evident in the spectrum. Excited states having $\Omega$ = 1, 2 and 3 have been identified. Dispersed fluorescence spectroscopy from eleven excited levels has been used to locate a large number of low-lying vibronic states within the energy range up to 8000 $cm^{-1}$. A ground state vibrational interval of ~575 $cm^{-1}$ is suggested.