

## THE PERMANENT ELECTRIC DIPOLE MOMENTS OF IRON MONOCARBIDE

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Iron monocarbide is the most thoroughly studied transition metal carbide. Here, we report on the study of numerous branch features in the (0,0)  $[12.0]\Omega = 2 \leftarrow X^3\Delta_3$  and (0,0)  $[13.1]^3\Phi_4 \leftarrow X^3\Delta_3$  band systems using high-resolution optical Stark spectroscopy. These intense band systems have been characterized very recently.<sup>1,2</sup> The electric field induced splitting was analyzed to produce values for the permanent electric dipole moments,  $\mu$ , of 4.02(6) D, 4.44(6) D and 2.36(3) D for the  $[12.0]\Omega = 2$ ,  $[13.1]^3\Phi_4$ , and  $X^3\Delta_3$  states, respectively. A comparison with other iron containing diatomic molecules and theoretical predicted values is made. The recent finite field *ab initio* prediction<sup>3</sup> of  $\mu$  is in reasonable agreement with the value of  $\mu(X^3\Delta)$ . Earlier calculations,<sup>4</sup> which employed an expectation value approach, are in poor agreement with the current experiment.

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