Abstract Submitted
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Spin Torque on Molecular Rotation Induced by Polarized Electrons[1] T.J. GAY, J.W. MASEBERG, University of Nebraska — We have measured the linear and circular polarization of 391.4 nm N_2^+ $B\ ^2\Sigma_u^+(v' = 0) \rightarrow X\ ^2\Sigma_g^+(v'' = 0)$ P-branch fluorescence produced by spin-polarized electron impact excitation of N_2 $X\ ^1\Sigma_g^+(v = 0)$ ground states. We find the linear polarization to be $\sim$0.03 for an energy range of 20 eV above threshold. Of particular note, however, is that the resulting non-zero values of the spin-normalized circular polarization (energy-averaged value of $P_3/P_e = 0.0133(8)$) indicate that spin-rotation coupling, in the absence of well defined electron orbital angular momentum ($\Lambda = 0$), acts to produce oriented rotational angular momenta in the excited molecular state prior to decay.

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