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NMR Probes of the Molecular Orientational Dynamics of the Endohedral Fullerene $Sc_3N@C_{80}$. JOE MARTINDALE, KRZYSZTOF GORNY, CHARLES PENNINGTON, Department of Physics, The Ohio State University, PAGE PHILLIPS, STEVEN STEVENSON, Department of Chemistry and Biochemistry, University of Southern Mississippi — We report NMR lineshapes and spin-lattice relaxation times for both ^{13}C and ^{45}Sc in the endohedral fullerene $Sc_3N@C_{80}$. The data show rapid reorientation of the molecule with an activated temperature dependence for the motion over the observed temperature range (50 – 350 K). The ratchet to rotator transition found in C_{60} is not observed in $Sc_3N@C_{80}$. The measurements strongly suggest the motion of the encapsulated Sc_3N derives from the reorientational dynamics of the C_{80} cage, however without the Sc_3N being fixed to the cage in the motional narrowing regime.

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