

# Magnetic resonance study of a vanadium pentoxide gel

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In this work we report results from continuous-wave (CW) and pulsed electron paramagnetic resonance (EPR) and proton nuclear magnetic resonance (NMR) studies of the vanadium pentoxide xerogel  $V_2O_5 \cdot nH_2O$  ( $n \approx 1.6$ ). The low temperature CW-EPR spectrum shows hyperfine structure due to coupling of unpaired  $V^{4+}$  electron with the vanadium nucleus. The analysis of the spin Hamiltonian parameters suggests that the  $V^{4+}$  ions are located in tetragonally distorted octahedral sites. The transition temperature from the rigid-lattice low-temperature regime to the high temperature liquid-like regime was determined from the analysis of the temperature dependence of the hyperfine splitting and the  $V^{4+}$  motional correlation time. The Electron Spin Echo Envelope Modulation (ESEEM) data shows the signals resulting from the interaction of  $^1H$  nuclei with  $V^{4+}$  ions. The modulation effect was observed only for field values in the center of the EPR absorption spectrum corresponding to the single crystals orientat