

Temperature Independent Isotropic EPR Spectra of $[(\text{CH}_3)_4\text{N}]_2\text{MnCl}_4$ and $[(\text{CH}_3)_4\text{N}]_2\text{FeCl}_4$ Single Crystals

F. Köksal, Ş. Bahadır, E. Başaran^a, and Y. Yerli

Physics Department, Faculty of Arts and Sciences,
Ondokuz Mayıs University, Samsun, Turkey

^a Physics Department, Faculty of Arts and Sciences,
High Technology Institute, Gebze, Istanbul, Turkey

Reprint requests to Prof. F. K.; Fax: 00903624576081.

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Electron paramagnetic resonance of $[(\text{CH}_3)_4\text{N}]_2\text{MnCl}_4$ and $[(\text{CH}_3)_4\text{N}]_2\text{FeCl}_4$ single crystals was studied between 20 and 400 K. The peak-to-peak derivative linewidths of these crystals seem not to change in this temperature interval and approximately 100 mT for $[(\text{CH}_3)_4\text{N}]_2\text{MnCl}_4$ and ~20 mT for $[(\text{CH}_3)_4\text{N}]_2\text{FeCl}_4$. The spectra were found to be isotropic, with $g = 2.0039$ for $[(\text{CH}_3)_4\text{N}]_2\text{MnCl}_4$ and $g = 2.0042$ for $[(\text{CH}_3)_4\text{N}]_2\text{FeCl}_4$. This temperature independence is attributed to isotropic strong exchange interactions of Mn^{2+} and Fe^{2+} nuclei, and it seems that hindered rotation of the MnCl_4^{2-} and FeCl_4^{2-} tetrahedra does not occur in this temperature interval.

Key words: EPR, Exchange, Peak-to-peak linewidth,
Temperature dependence, $[\text{MnCl}_4]^{2-}$, $[\text{FeCl}_4]^{2-}$.