EPR Studies of Highly Interconnected Nanostructured Polyani- 
line Network\textsuperscript{1} OLUDUROTIMI O. ADETUNJI, N.-R. CHIOU, N.P. RAJU , 
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43210-1117 — We present temperature-dependent X-band electron paramagnetic 
resonance susceptibility and linewidth studies of nanostructured polyaniline doped 
with perchloric acid (PANN/HClO\textsubscript{4}). From analysis of the EPR data we determine 
that network has both Pauli- and Curie-like susceptibility with $X^P$ of $\sim 2 \times 10^{-5}$ 
emu/mole-2-ring repeat unit and a localized spin density of $\sim 1$ spin per 400 2-ring 
repeat units and exhibits a Lorentzian-like lineshape. The EPR linewidth from 100 
K to room temperature exhibits two different linear regimes, where the linewidth 
increases linearly with increase in temperature. We will discuss the role of Korringa 
relaxation in determining the high temperature linewidth. We will consider the roles 
of disorder, localization and interfiber contact within the nanostructure network.

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