# Magnetic and Electric Studies of a New Cu(II) Perovskite-like Material

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Thermal analysis of a lipid-like bilayer of $[(CH_2)_9\ (NH_3)_2]CuCl_4$ indicates one minor transition at 303 K and the following five major ones (with entropies in J/K-mole):

$$\underset{(VI)}{\text{Phase}}\ \overset{T_5=188\,K}{\Delta S_5=5.43}\ \underset{(V)}{\text{Phase}}\ \overset{T_4=228\,K}{\Delta S_4=1.90}\ \underset{(IV)}{\text{Phase}}\ \overset{T_3=288\,K}{\Delta S_3=4.06}\ \underset{(III)}{\text{Phase}}\ \overset{T_2=346\,K}{\Delta S_2=0.36}\ \underset{(II)}{\text{Phase}}\ \overset{T_1=383\,K}{\Delta S_1=3.80}\ \underset{(I)}{\text{Phase}}.$$

The initial magnetic susceptibility at 320 Hz and a magnetic field of 160 A/m in the temperature range 75 – 290 K revealed a Curie-Weiss behavior of phase (V) and possible ferromagnetic ordering of phases (VI) and (IV) at low temperatures. The variation of the dielectric permittivity with temperature at 60.0 Hz – 100 kHz indicates large changes of the dipole moment at the transition temperatures. The conductivity is thermally activated and frequency dependent, following the universal power law: $\sigma(\omega) = \sigma_{dc} + A(T)\omega^{s(T)}$. Values of $s$ being phase dependent. For phase (I), $T > 383$ K, band type conduction prevails. Hopping conduction is found in phases(II) and (III). Comparison with other Cu- and Cd-containing materials is made. — PACS: 76, 77

*Key words:* Magnetic Susceptibility; AC Conductivity; Permittivity; Structure Transitions.