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Characterization of Phase Transitions in Vanadium Deuterides

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distribution of free charge on one-dimensional, finite conductors. In particular, a system of two such conductors possessing equal but opposite charge can be used to model the cross section of a parallel plate capacitor. The free charge distribution on the plates has been studied as a function of plate separation. Using the procedure of Merrill, the electric field between and around the edges of the plates has been mapped out and compared to that produced by a uniform charge distribution.


C 7 Characterization of Phase Transitions in Vanadium Deuterides. R. L. TOBER and G. BAMBAKIDIS, Wright State University. * - Resistivity and differential scanning calorimetry were used to locate transition points on the V-D2 phase diagram for x in the range 0.5 to 0.8 and for temperatures ranging from 100 K to 300 K. From the resistivity data, the character of the \( \gamma \rightarrow \delta \) transition near 150 K at the stoichiometric composition \( V_4D_3 \) was determined. The \( \gamma \rightarrow \delta \) transition temperature at this composition was also found from X-ray diffraction measurements of the lattice parameters of the orthorhombic vanadium lattice.

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C 8 Constraints on Lepton Numbers in Big Bang Nucleosynthesis. R.C. Tabak, Youngstown State University. ---Predictions of the abundances of light elements produced in the Big Bang using the Standard Model of the Universe agree quite well with observation. This appears to indicate that the Universe is open. However, recent discoveries of both a theoretical and observational nature demonstrate that the mass density of the Universe may be greater than previously expected. This would require modification of the Standard Model, one of the most plausible being the addition of neutrino degeneracy. Using the constraints that \( n_e \sim 1 \) and that the age of the Universe is between 10-20 \( 10^9 \) yrs., I have obtained the following ranges of values for the electron and muon numbers, respectively: \(-4.4 \times 10^{-5} \leq L_e \leq 0.439 \) and \( 6.6 \times 10^{-4} \leq L_\mu \leq 1.70 \). This enables one to predict that 6.7 \( \times 10^{-5} \leq \delta \mu/\delta \leq 1.5 \times 10^{-5} \) and \( 6.0 \times 10^{-11} \leq \delta \mu/\delta \leq 2.0 \times 10^{-9} \). These values agree with the observed abundances of these elements.

*Submitted by Stephen Hanzely