$Co[V_2]O_4$: A Spinel approaching the itinerant electron limit

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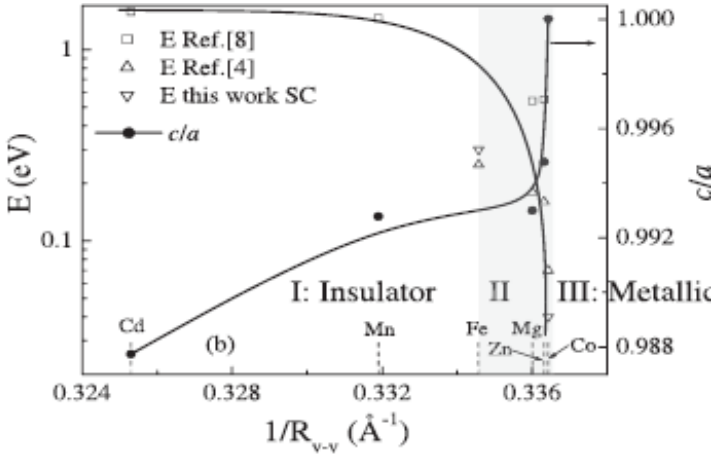
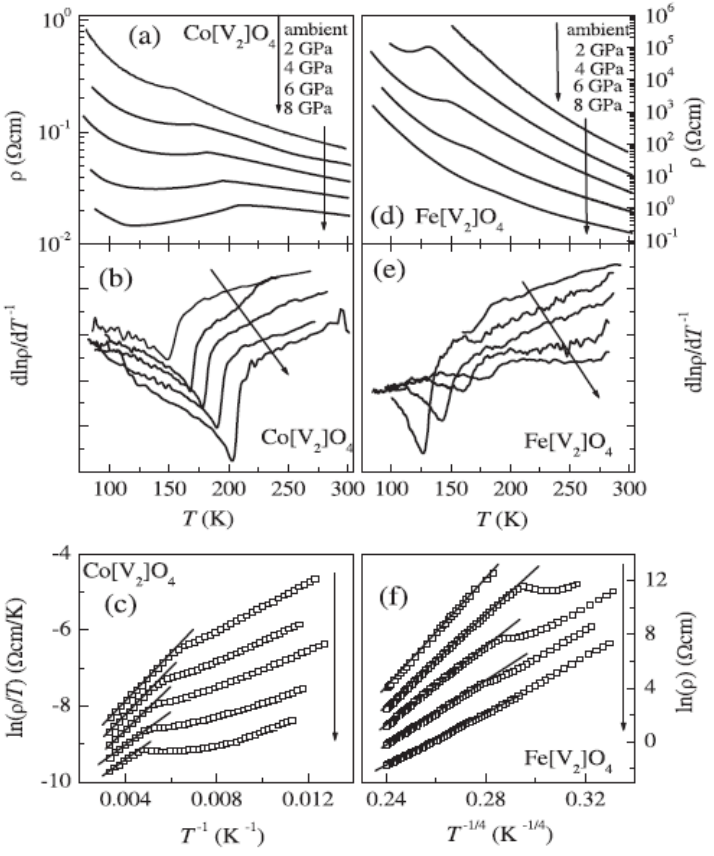


E and *c*/*a* ratio of AV_2O_4 spinels as a function of V-V distance. With decreasing V-V distance, AV_2O_4 can be separated as three regions with different electronic behaviors



Studies of the structure, magnetization, and resistivity under pressure on stoichiometric normal spinel $Co[V_2]O_4$ single crystals show (i) absence of a structural distortion, (ii) abnormal magnetic critical exponents, and (iii) metallic conductivity induced by pressures at low temperatures. All these results prove that $Co[V_2]O_4$ sits on the edge of the itinerant-electron limit. Compared with similar measurements on $Fe[V_2]O_4$ and other AV_2O_4 studies, it is shown that a critical V-V separation for a localized-itinerant electronic phase transition exists.

The temperature dependencies of resistivity under different pressures for $Co[V_2]O_4$ and $Fe[V_2]O_4$.

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