MANIFESTATIONS OF CORRELATION–DRIVEN METAL INSULATOR TRANSITIONS IN TRANSITION METAL COMPOUNDS

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Electron correlation effects have become increasingly important in the interpretation of electrical properties and phase transformations of materials that are very poor metals or insulators. Three examples will be discussed: pure and doped V_2O_3, pure and doped Fe_3O_4, and the $NiS_{2-x}Se_x$ system with $0 \leq x \leq 0.71$. The methods of single crystal growth of these materials, and their electrical, magnetic and thermodynamic properties will be reviewed. Elementary arguments will be provided to show that the experimental findings can all be rationalized on the basis of electron correlation effects. The experimental manifestations of the electronic interactions will be emphasized.

9.7 cm

13.4 cm

Subject category :

1. Correlated Electrons and High Temperature Superconductors

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