Phonon-assisted electron hopping conduction in the uranium doped one-dimensional antiferromagnet Ca_2CuO_3

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Abstract: The authors studied the conduction mechanism in an uranium doped low dimensional magnetic system Ca_2CuO_3. This system exhibits the S=1/2 quasi ID antiferromagnetic chains of -Cu-O- with strong magnetic coupling, and demonstrates continuous semiconductor-like behavior with constant covalent insulator character. This paper identifies the conduction is due to thermally activated phonon-assisted electron hopping betwee dopant uranium sites. The parameter ?, the characteristic for hopping probability, was determined to be 0.18 $??^{-1}$. This value manifests a relatively stronger hopping probability for Ca_2CuO_3 as compared with other uranium doped ceramics. ?? 2008 Journal of Magnetics.

Author Keywords: Antiferromagnet; Conduction; Phonon-assisted; Uranium

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