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Magnetic and structural transitions tuned by non-magnetic Ti doping in Ca3Ru2O7 JIN PENG, GAOCHAO WANG, Department of Physics and Engineering Physics, Tulane University, New Orleans, LEONARD SPINU, Advanced Material Research Institute and Physics Department, University of New Orleans, LA, XIANGLIN KE, TAO HONG, Scattering Science Division, Oak Ridge National Laboratory, Oak Ridge, TN, ZHIQIANG MAO, Department of Physics and Engineering Physics, Tulane University, New Orleans — We report the effect of Ti doping on the structural and magnetic transitions in the bilayer Ruthenate Ca3Ru2O7. Ca3Ru2O7 orders antiferromagnetically at 56 K followed by a simultaneous structural and metal-insulator transition at 48 K [1]. Ti doping in Ca3Ru2O7 causes dramatic changes in both antiferromagnetic and structural transitions. With the Ti doping concentration above 5%, both transitions move to much higher temperature and merge, e.g. TN 85 K for 5% Ti, 113 K for 10% Ti. For the latter sample, the structural parameters change much more remarkably through the transition compared to Ca3Ru2O7 [2]. Such structural and magnetic transitions tuned by Ti-doping highlight the strong spin-lattice coupling in Ca3Ru2O7. Neutron scattering measurement on these samples will also be discussed.

[1] Cao G et al; PRB 78, 1751 (1997)
[2] Yoshida Y et al; PRB 72, 054412 (2005)

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