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Neutron studies of iron-based superconductors

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The study of magnetic structure and neutron scattering on potassium intercalated iron selenide (K2Fe4Se5) and its doped system (K1.9Fe4+x-yAySe5, A=Cu/Mn) is presented here. An intriguing phenomena is observed in the magnetic properties due to doping, which could provide different view to the mechanism of superconductivity. Excess iron in the Fe-chalcogenide family, appears to somehow induce Fe-vacancies from an ordered to a disordered state which may be the origin of superconductivity. In this study, extra iron dopants induce superconductivity in the parent compound, K2Fe4Se5, while extra manganese and copper doping suppresses superconducting behavior. The long range magnetic ordering temperature (TN) is confirmed to be lower than the Fe-vacancy order-to-disorder temperature (TVO). Anisotropic transport properties are shown to exist in K2Fe4Se5 [1]: the interlayer properties playing an important role in superconductivity. Manganese and copper substitution of iron sites, however, induce the shift of the superconducting critical temperature and the suppression of superconductivity due to the change in competition between anti-ferromagnetism and superconductivity in this 245 system [2-3].

Reference
[1] Y. J. Song, Z. Wang, Z.W. Wang, H. L. Shi, Z. Chen, H. F. Tian, G. F. Chen, H. X. Yang and J. Q. Li, European Physics Letter, 95, 37007 (2011)
[2] Tzu-Wen Huang, Ta-Kun Chen, Kuo-Wei Yeh, Chung-Ting Ke, Chi Liang Chen, Yi-Lin Huang, Fong-Chi Hsu, Maw-Kuen Wu, Phillip M. Wu, Maxim Avdeev, and Andrew J. Studer, Physical Review B 82, 104502 (2010)
[3] Dian Tan, Changjin Zhang, Chuanying Xi, Langsheng Ling, Lei Zhang, Wei Tong, Yi Yu, Guolin Feng, Hongyan Yu, Li Pi, Zhaorong Yang, Shun Tan, and Yuheng Zhang, Physical Review B 84, 014502 (2011)

Primary author(s) : Ms YANG, Jie-Yu (Shirley) (Institute of Physics, Academia Sinica, Taipei, Taiwan)

Co-author(s) : STAMPFL, Anton (Australian Nuclear Science and Technology Organisation); Dr WANG, Chin-Wei (National Synchrotron Radiation Research Center, Taiwan); CLEMENTS, Richard; Dr HUANG, Kuo-Chung (Institute of Physics, Academia Sinica, Taipei, Taiwan); Mr WANG, Chin-Han (Institute of Physics, Academia Sinica, Taipei, Taiwan); Prof. LEE, Chih-Hao (Engineering and System Science, National Tsing Hua University, Taiwan); Prof. WU, Maw-Kuen (Institute of Physics, Academia Sinica, Taipei, Taiwan)

Presenter(s) : Ms YANG, Jie-Yu (Shirley) (Institute of Physics, Academia Sinica, Taipei, Taiwan)

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