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Controllable ferromagnetism of iron doped topological insulator SHAN QIAO, ZHEN LIU, FUHAO JI, BIN LI, FUCHUN XI, fudan university, K. KURODA, MAO YE, K. MIYAMOTO, A. KIMURA, Hiroshima University — The higher than room temperature ferromagnetism was found in iron doped Bi₂Se₃. Samples generated by different processes have different magnetic characters. The Curie temperature is independent on iron concentration which against all discovered dilute magnetic systems. EXAFS observations show that the local structure of iron in samples with paramagnetic character is complex. On the contrary, that with ferromagnetic character is very simple that the iron atoms make up small single atom, dimer or trimer structures and these structures randomly distributed in Bi₂Se₃ crystal. The ferromagnetism can be enhanced or suppressed by the shift of Fermi edge by co-doping of Mg and Fe to Bi₂Se₃ crystal. The less than 3 atoms small structure cannot have room temperature ferromagnetism, so we believe that the higher than room temperature controllable ferromagnetism is intrinsic character of iron doped topological insulator.

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