Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Bulk Superconductivity in Fe(Te,Se) Single Crystals Induced by Post Annealing TSUYOSHI TAMEGAI, Department of Applied Physics, The University of Tokyo, YUE SUN, Department of Physics, Southeast University, YUJI TSUCHIYA, TATSUHIRO YAMADA, TOSHIHIRO TAEN, SUNSENG PYON, Department of Applied Physics, The University of Tokyo, ZHIXIANG SHI, Department of Physics, Southeast University — Fe(Te,Se) has the simplest structure among all iron-based superconductors. However, as-grown crystals of Fe(Te,Se) do not show superconductivity, and post treatment is necessary to induce superconductivity. We found that the annealing in controlled O_2 atmosphere or other chalcogen (Te, Se, S) atmosphere at relatively low temperatures is very effective to induce superconductivity. During the annealing process, some iron oxides or iron chalcogenides are formed on the surface of the crystal, that effectively extract excess iron from the crystal. Physical properties such as resistivity, Hall coefficient, magnetization, specific heat, and the critical current density are measured before and after the post annealing to discussed the intrinsic properties of Fe(Te,Se) superconductors.

Tsuyoshi Tamegai
Department of Applied Physics, The University of Tokyo

Date submitted: 14 Nov 2013 Electronic form version 1.4