# Superconductivity and Magnetism of Annealed $FeSe_{1-x}Te_x$ ($0.6 \leq x \leq 1$) Single Crystals Seen from Specific Heat and $\mu$SR

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We have investigated annealing effects on the superconductivity and magnetism of $FeSe_{1-x}Te_x$ ($0.6 \leq x \leq 1$) single crystals annealed at 300 - 500 °C for 100 - 200 h in vacuum. A clear jump of the specific heat at $T_c$ has been observed for $0.6 \leq x \leq 0.9$, indicating that bulk superconductivity is realized. It has been found that the electronic specific-heat coefficient in the normal state, $\gamma_n$, is much larger than the value estimated from the band calculation and increases with increasing x and suddenly decreases above $x = 0.9$. The large value of $\gamma_n$ is guessed to be due to the enhancement of the effective mass related to spin fluctuation and/or orbital fluctuation. The decrease in $\gamma_n$ above $x = 0.9$ is due to the antiferromagnetic ordering around $x = 1$. It has been found that there remains a finite value of the electronic specific-heat coefficient at 0 K even in the superconducting state at $x = 0.8$ and 0.9, meaning that there remains normal-state carriers at 0 K. Moreover, $\mu$SR measurement have revealed that magnetic correlation is developed at low temperatures at $x = 0.8$ and 0.9, though no sign of antiferromagnetic ordering is observed in the magnetic susceptibility measurements. Therefore, there is a possibility that the superconductivity coexists with fluctuating antiferromagnetism at $x = 0.8$ and 0.9.