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Structure and magnetic properties on $\text{Y}_{0.26}\text{Sr}_{0.72}\text{CoO}_{3-\delta}$ single crystal YUFENG ZHANG, SHO SASAKI, MITSURU IZUMI, Laboratory of Applied Physics, Tokyo University of Marine Science and Technology — We studied structural and magnetic properties on a single crystal of $\text{Y}_{0.33}\text{Sr}_{0.67}\text{CoO}_{3-\delta}$ in nominal composition. Single crystal was grown by the floating-zone method with radiation heating. Both electron-probe microanalysis (EPMA) and inductively coupled plasma (ICP) spectroscopy indicated the obtained single crystal was $\text{Y}_{0.26}\text{Sr}_{0.72}\text{CoO}_{3-\delta}$ in composition. The iodometric titration gives the oxygen content of 2.95. These results show that almost all Co ions are in trivalent state. The dc magnetization increases remarkably to reach a maximum at 301 K, then falls abruptly with decreasing temperature after both cooling and zero-field cooling. These behaviors were interpreted as a successive transition in which with decreasing temperature there is a transition from paramagnetic to ferromagnetic and eventually the antiferromagnetic properties appear at low temperatures. This should be associated with a successive spin state transition of Co ions [1, 2]. The detailed structural study and magnetic anisotropy will be reported and discussed with respect to a possible spin state change of Co ions. [1] Y. F. Zhang et al., accepted by Phys Rev. B for publication. [2] Y. F. Zhang et al., published in JMMM.

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