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Thermodynamic properties of Ca_{1.82}Na_{0.18}CuO₂Cl₂ single crystals KYUNG-HEE KIM, HEON-JUNG KIM, JUNG-DEA KIM, H.-G LEE, SUNG-IK LEE, POSTECH, NATIONAL CREATIVE RESEARCH INITIATIVE CENTER FOR SUPERCONDUCTIVITY AND DEPARTMENT OF PHYSICS, POHANG TEAM — We report the experimental results on the reversible magnetization of high quality Ca_{1.82}Na_{0.18}CuO₂Cl₂ single crystals in the high-pressure condition of about 5.2 GPa. The superconducting transition temperature T_c (~ 27 K) of this single crystal is the highest reported in this family. The magnetizations are analyzed using the Hao-Clem model and the high-field scaling law. From these analysis, we have obtained various thermodynamic parameters such as the penetration depth and the critical fields, and clarified the dimensional nature of the superconductors. Even though the doping content between Ca_{1.82}Na_{0.18}CuO₂Cl₂ and La_{1.82}Sr_{0.18}CuO₄ is same, the physical properties of these materials are quite different. For example, $\lambda_{ab}(0)$ is estimated to be 440 nm, which is larger than that of La_{1.82}Sr_{0.18}CuO₄. These changes are totally unexpected in this iso-structural superconductor.

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