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Independent control of carrier concentration and interlayer spacing in Li_xHfNCl layered superconductors TAKUMI TAKANO, ATSUSHI KITORA, TSUKASA KISHIUME, Institute for Materials Research, Tohoku University, YASUJIRO TAGUCHI, FRS-CMRG, RIKEN, YOSHIHIRO IWASA, Institute for Materials Research, Tohoku University, INSTITUTE FOR MATERIALS RESEARCH, TOHOKU UNIVERSITY, SENDAI 980-8577, JAPAN TEAM, FRS-CMRG, RIKEN, WAKO, SAITAMA 351-0198, JAPAN TEAM, CREST, JAPAN SCIENCE AND TECHNOLOGY CORPORATION, KAWAGUCHI 332-0012, JAPAN COLLABORATION — Alkali-metal and organic molecule co-intercalated HfNCl is a new class of layered superconductors with relatively high transition temperature (T_c) of 25.5 K. Recently, we have succeeded in synthesis of single phase samples of $\text{Li}_x(\text{molecule})_y\text{HfNCl}$ with a wide range of doping concentration of $0.10 \leq x \leq 0.50$, where we are able to, continuously and independently, control the carrier density and interlayer distance d between the conducting Hf-N layers by means of co-intercalation of Li and organic molecule. Without any molecule, superconductivity appears at $x \sim 0.15$ and T_c is almost constant against x above this critical value. Furthermore, we found that T_c is enhanced ($\sim 30\%$) from 20 K to 25.5 K with increasing of d .

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