

Abstract Submitted  
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**Independent control of carrier concentration and interlayer spacing in  $\text{Li}_x\text{HfNCl}$  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  $d$ .

Takumi Takano  
Institute for Materials Research, Tohoku University

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