

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Superconductivity in an Alkali Doped Polycyclic Aromatic Hydrocarbon, Picene MADOKA TOKUMOTO, FUMIHIKO SHIMIZU, YOSHI-
AKI HATA, SHINYA SAWAI, National Defense Academy, JING HAN, KATSUYA
INOUE, Hiroshima University — The effect of carrier doping into polycyclic aromatic hydrocarbons, including perylene and pentacene, has been extensively studied.[1] As a result of halogen or alkali metal doping, a drastic increase in electrical conductivity was observed. However, superconductivity has not been reported except the one by Schön et al.[2] Recently, Kubozono reported that one of them, i.e. picene ($C_{22}H_{14}$) showed superconductivity at 20 K by doping with potassium.[3] We anticipate that it will lead to surprising findings of hidden organic molecular superconductors. In this presentation, we will report on the characterization of superconducting properties of alkali doped picene. Instead of ordinary vapor phase alkali metal doping, we employ thermal decomposition of alkali azides, i.e. AN_3 where $A = K, Rb$. We followed the doping procedure of thermal decomposition applied to fullerene C_{60} . [4] A systematic variation of the superconducting transition temperature and fraction are studied as a function of alkali metal composition. [1] H. Akamatu, H. Inokuchi, and Y. Matsunaga, *Nature* 173 (1954) 168. [2] J. H. Schön, Ch. Kloc & B. Batlogg, *Nature* 406 (2000) 702; retraction, *Nature* 422 (2003) 93. [3] R. Mitsuhashi, Y. Kubozono et al.: private communication. [4] M. Tokumoto, et al., *J. Phys. Chem. Solids*, 54 (1993) 1667.

Madoka Tokumoto
National Defense Academy

Date submitted: 20 Nov 2009

Electronic form version 1.4