Superconductivity in C-C bond connecting molecules

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Organic compounds are always promising candidates of superconductors with high transition temperatures T_c's. Here we will talk about our recent discovery of superconductivity in polyparaphenylene oligomers. We will show that doping C-C bond connecting molecules – *p*-terphenyl [1] or *p*-quaterphenyl [2] by potassium can bring about superconductivity above 120 K at atmosphere pressure, which is comparable to the highest T_c in cuprates. Superconductivity has also been found in other oligomers with short or long chain lengths [3,4]. The easy processability, light weight, durability of plastics, and environmental friendliness of these new superconductors have great potential for the fine-tuning of electrical properties. This discovery opens a window for exploring high temperature superconductivity in chain link organic molecules.

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[2] J. F. Yan, R. S. Wang, K. Zhang, and X. J. Chen, arXiv:1801.08220.

[3] K. Zhang, R. S. Wang, A. J. Qin, and X. J. Chen, arXiv:1801.06320.

[4] G. Huang, R. S. Wang, and X. J. Chen, arXiv:1801.06324.