



Superb Electrically Conductive Graphene Fibers via Doping Strategy

Yingjun Liu, Zhen Xu, Chao Gao*

Department of Polymer Science and Engineering, Zhejiang University



Motivation

- Graphene fibers (GFs) are hoped to inherit the exceptional electrical conductivity of single graphene sheet.
- Chemical doping is a most effective method to increase the carrier density of carbonaceous materials.

Project Goal: Upgrade the electrical conductivity of GFs to benchmark metals.

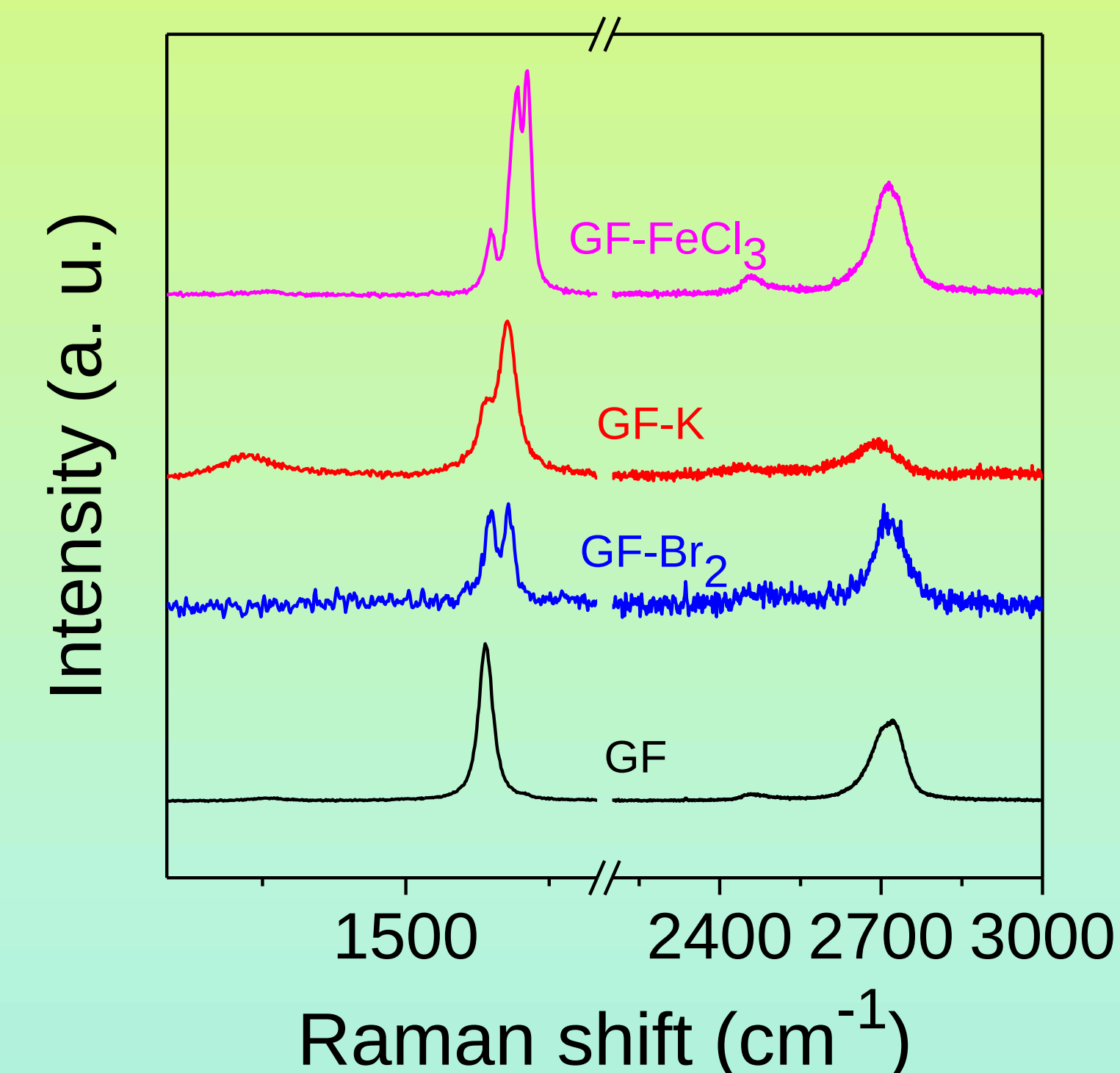
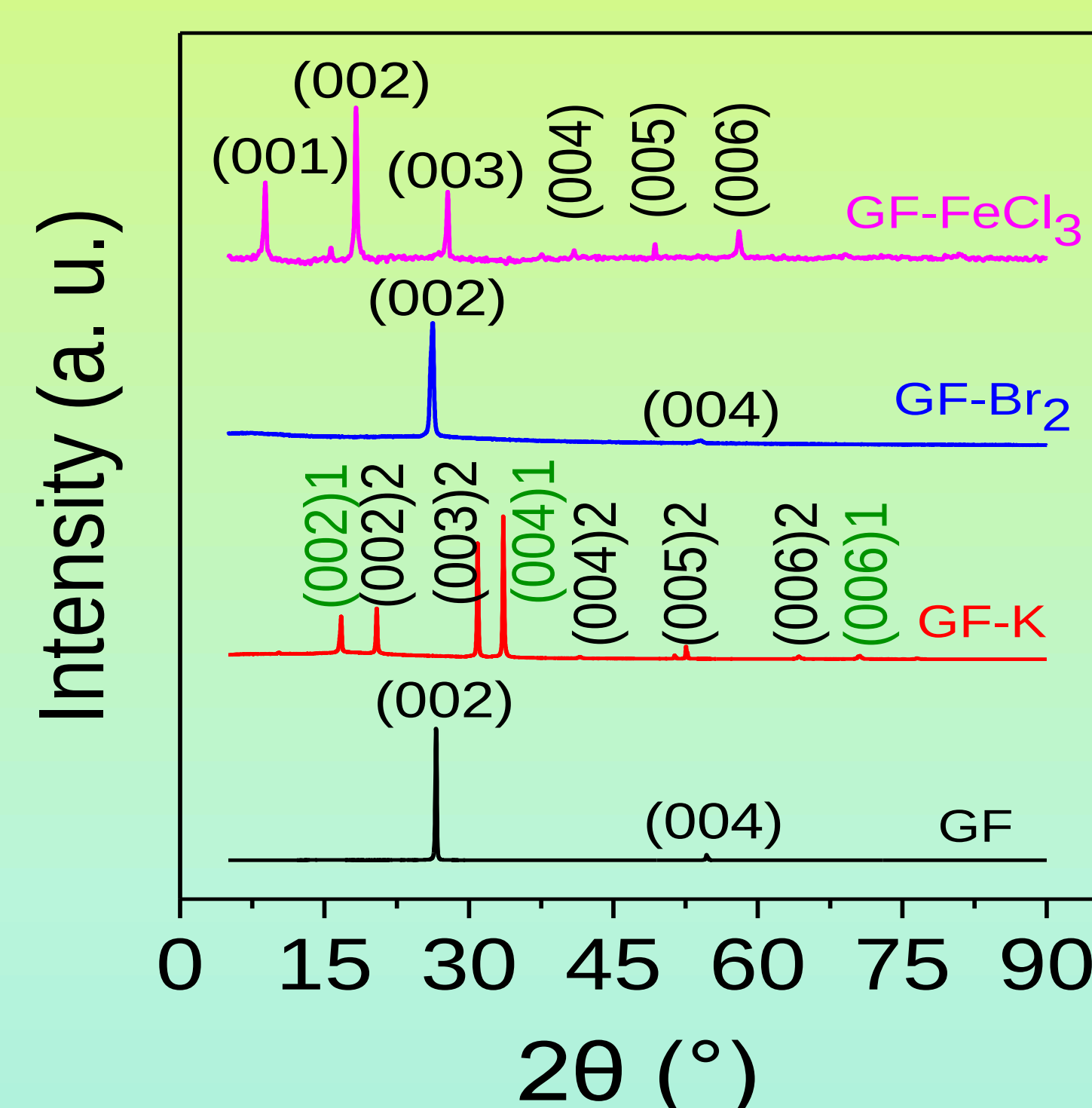
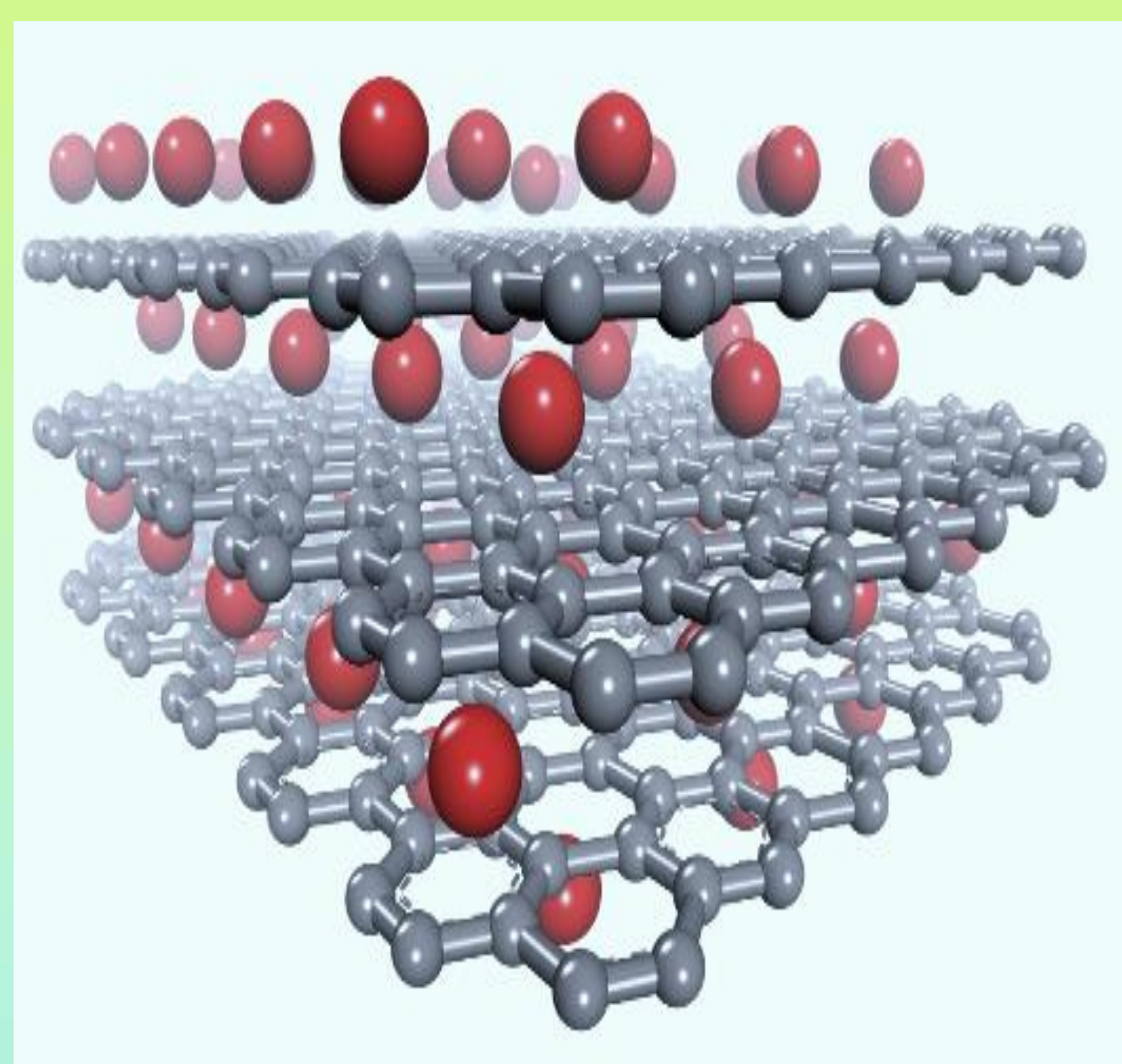


Figure 1. Photograph of K doped GFs with golden-yellow colour and structural model of the basic unit in the doped GF.

Figure 2. Structural characterization of the GFs by XRD and Raman spectroscopy.

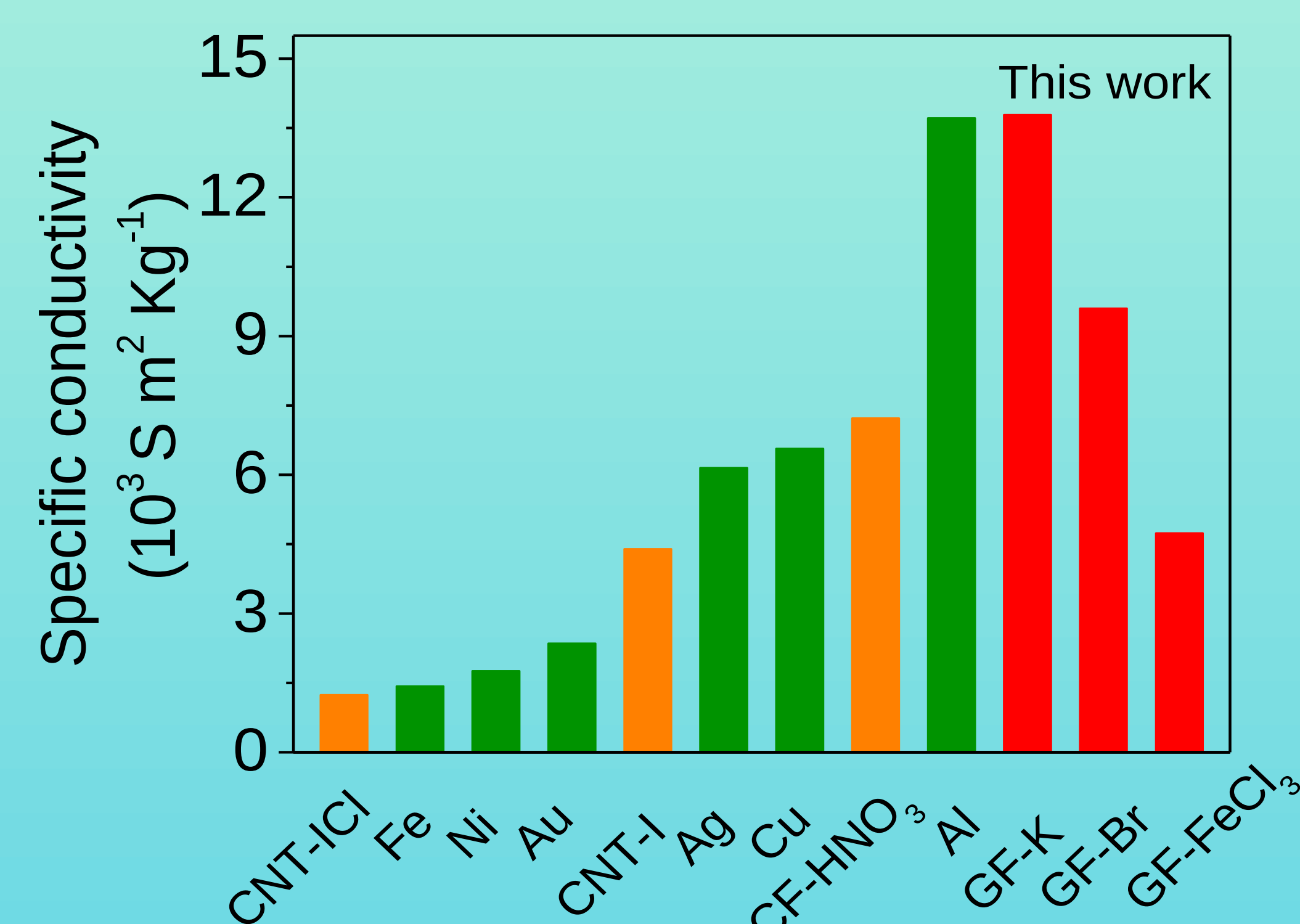
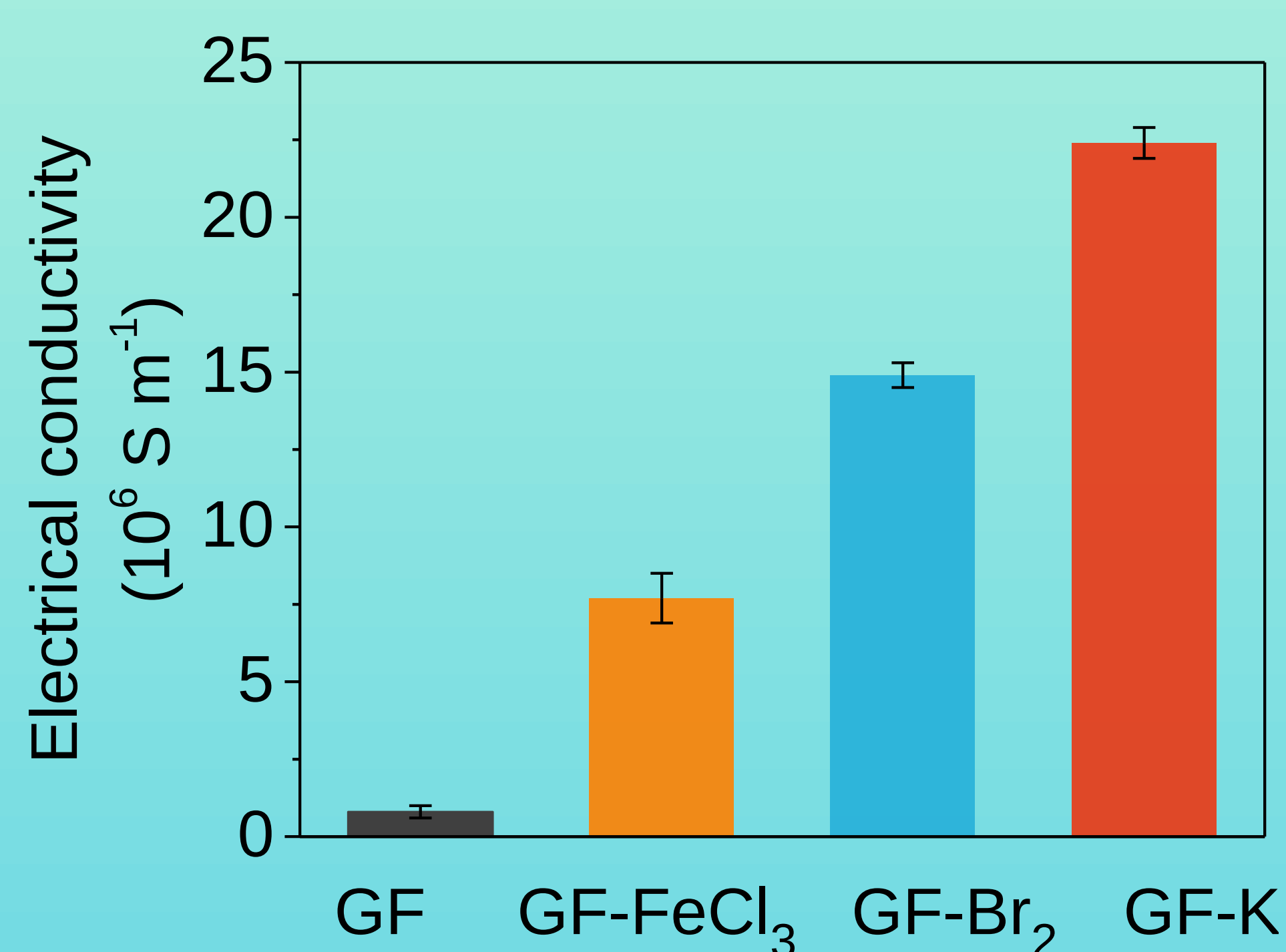
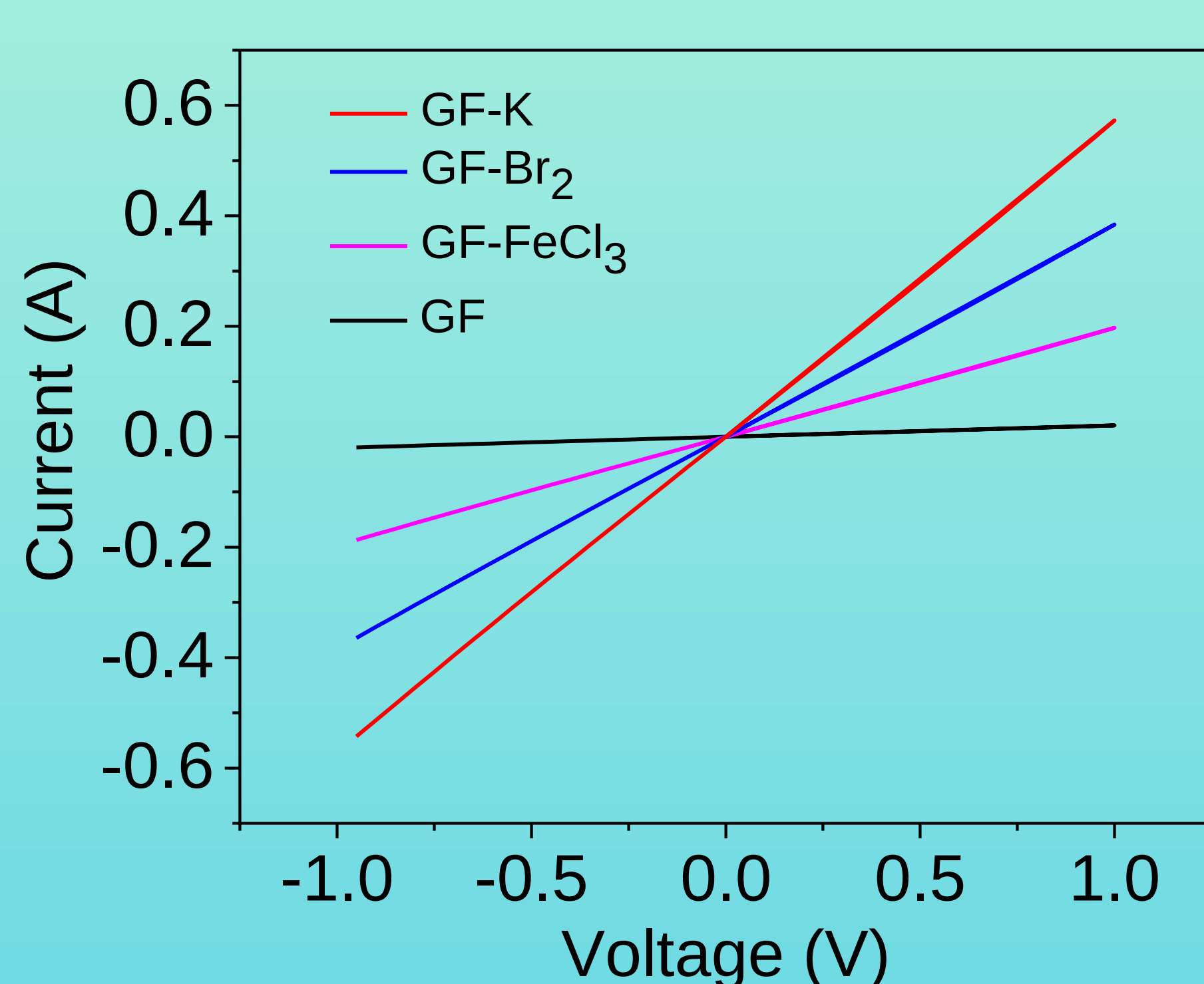


Figure 3. Electrically conductive performance of the GFs and comparisons with other conductors like metals and CNT fibers.

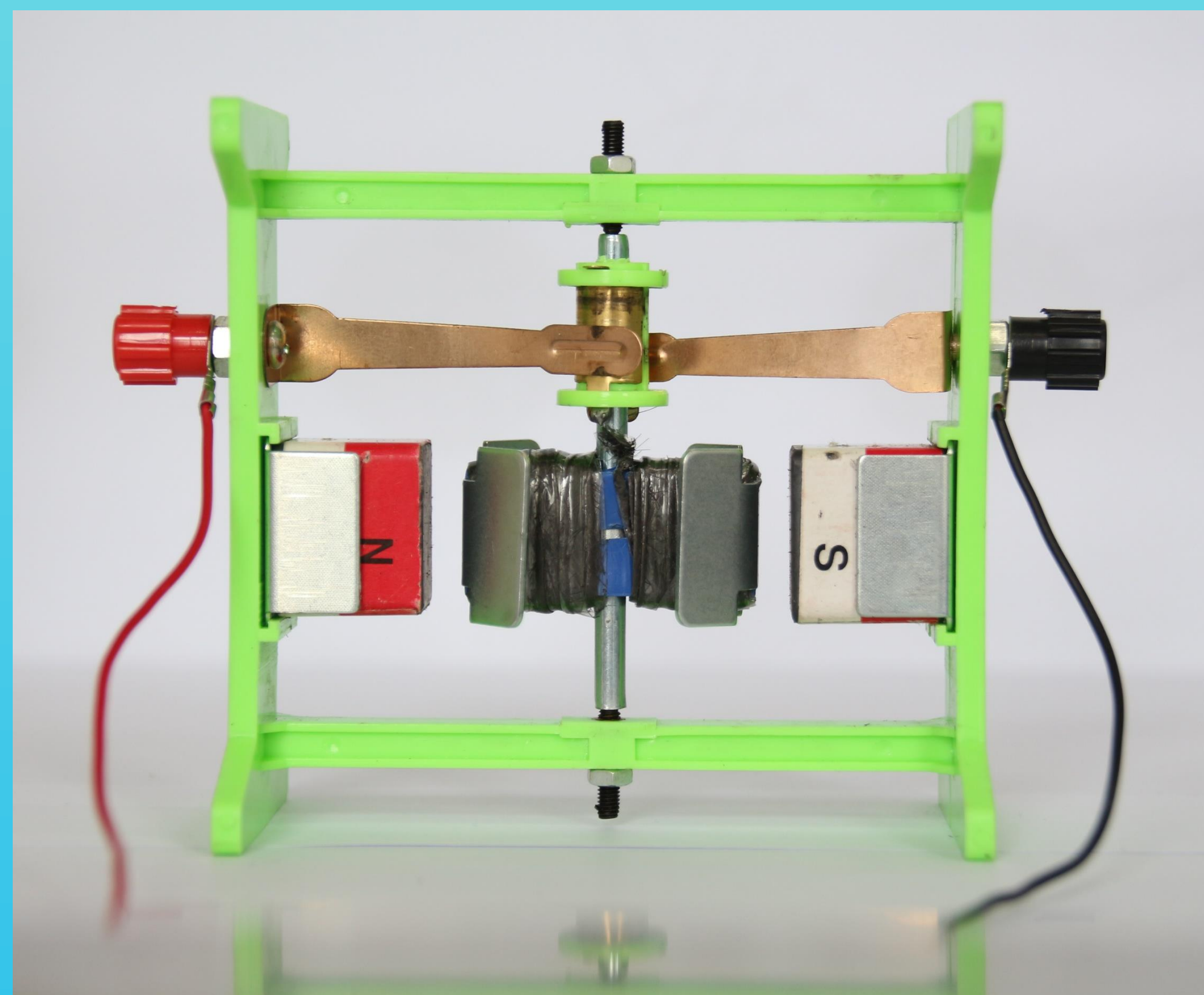


Figure 4. Applications of GFs to replace copper as long conducting wires, lightweight rotator coils, and USB cables.

Conclusion:

- ◆ Chemically doped GFs with ultrahigh electrical conductivity were fabricated through a simple post-doping approach.
- ◆ The combination of lightness, superb electrical conductivity, and easy scalability renders GFs remarkable potential in the field of electrical engineering and smart wearable devices.

References:

1. Y. J. Liu, Z. Xu, et al. *Adv. Mater.* 2016, DOI: 10.1002/adma.201602444.
2. Z. Xu, Y. J. Liu, et al. *Adv. Mater.* 2016, 28, 6449.

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Email: yjl107@163.com