Oxidation-resistant Cu-based nanowires transparent electrodes

activated by an exothermic reaction

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| *Schematic of most common approaches for preparing bimetallic CuM NW-based transparent electrodes* |

Metallic nanowire percolating networks are one of the promising alternatives to conventional transparent conducting electrodes. Among the conductive metals, copper appears as a relevant alternative to develop electrodes in a more sustainable and economical way (abundance of the supplies, geo-political risks regarding the supplies, environmental impact, and cost).[1]  However, Cu nanowires suffer from high instability in air, and one of the ways to increase stability as well as to boost properties related to transparent electrodes is to combine the Cu with another metal, resulting in bimetallic nanowires. Even though the field of fabrication of nanoalloys has been advancing at a rapid pace in the last two decades, binary nanowires are difficult to produce due to a wide range of parameters that must be aligned in regard to metals that are being combined. We are currently experimenting how the allowing of Cu-based nanowires with nickel can be exploited for the development of metal nanowire networks with high oxidation resistance. We report a novel synthesis and a new way of optimizing performance of a CuNi transparent electrode through enhancing interconnectivity of NWs, based on a reducing treatment at room conditions. [2]

[1] A. Križan, K. Zimny, A. Guyonnet, E. O. Idowu, E. Duguet, M. Plissonneau, L. d’Alençon, T. Le Mercier, M. Tréguer-Delapierre, *Nano Ex.* **2023**, *4*, 042001.

[2] A. Križan, L. Bardet, K. Zimny, M. Romanus, M. Berthe, C. Labrugère-Sarroste, D. Bellet, M. Tréguer-Delapierre, *ACS Nano* **2024**, *18*, 34902.