

SUPERCONDUCTIVITY IN CHROMIUM OXIDE THIN FILMS EMBEDDING SILVER

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Superconductivity has become one of the most thoroughly researched and utilised quantum mechanical phenomena. The search for novel materials exhibiting the necessary properties being an ongoing process for more than a century [1], [2]. Recently, Stanev *et al.* [3] implemented machine learning modelling to propose novel materials which might exhibit superconductivity. Based on this research, we synthesized silver chromium oxide by atomic layer deposition and thermal evaporation, creating nanolaminates consisting of chromium oxide layers embedding silver (Image 1). The resulting thin film structure showed clear superconductivity in some of the samples, with a T_c at around 3,5 K (Figure 1), allowing one to possibly consider the created material for use in advanced applications, such as the superconducting element in chips for quantum computers.

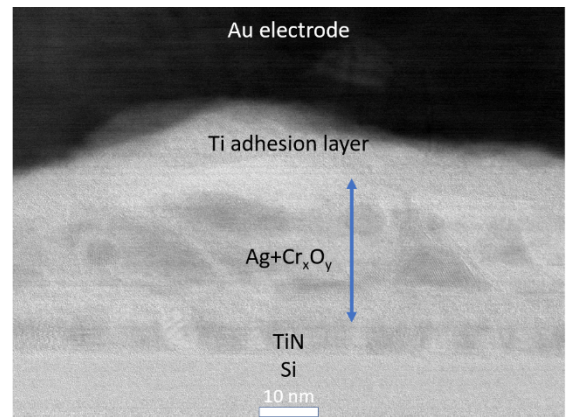


Image 1, Scanning transmission electron microscope image showing the structure of the nanolaminate after resistivity measurements at 2K.

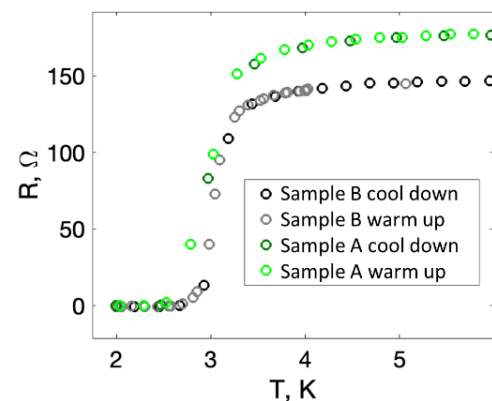


Figure 1, Resistance measurements of chromium oxide embedding Ag thin film samples.

References

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2. Bednorz, J. G. & Müller, K. A. Susceptibility measurements support high- T_c superconductivity in the ba-la-cu-o system. Zeitschrift für Phys. B - Condens. Matter 64, 189–193 (1986). <https://doi.org/10.1007/BF01303701>
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