

Abstract Submitted
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Search for Superconductivity in Cu-Chlorides and Ferromagnetism in Partially Oxidized CuCl¹ THOMAS SAERBECK, JUAN PEREIRO, JAMES WAMPLER, JACOB STANLEY, JAMES WINGERT, OLEG G. SHPYRKO, IVAN K. SCHULLER, Department of Physics and Center for Advanced Nanoscience, University of California San Diego — The phase diagram of copperhalides shows a rich diversity not only in crystalline structure, but also in magnetic and electronic properties. In particular, the chemically unstable CuCl has been proposed several times as a candidate for high-temperature superconductivity. We present a search for superconductivity in systems of CuCl/Si and CuCl₂/Si, which leads to the observation of ferromagnetism with a T_c of 18 K in bulk CuCl samples [1]. The hitherto unreported magnetism is found to emerge in pure CuCl upon prolonged exposure to humid air. Magnetic field modulated microwave spectroscopy in addition to SQUID magnetometry and x-ray diffraction are used to identify phase transitions and compare them to the antiferromagnetic transitions in other Copperchloride structures.

[1] T. Saerbeck, J. Pereiro, J. Wampler, J. Stanley, J. Wingert, O. G. Shpyrko, and Ivan K. Schuller, *Journal of Magnetism and Magnetic Materials* **346**, 161 (2013).

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