# Search for Magnetic Ordering and Structural Distortions in the Layered Perovskite, $Sr_2VO_4$

B. R. T. K. Van Wyk[1], H. J. Silverstein[2], R. L. Donaberger[3], C. R. Wiebe[1, 2]

[1] Department of Chemistry, University of Winnipeg, Winnipeg, MB, Canada
[2] Department of Chemistry, University of Manitoba, Winnipeg, MB, Canada
[3] Canadian Neutron Beam Centre, Chalk River Laboratories, Chalk River, ON, Canada

The perovskite family is well known to exhibit a diverse range of intriguing properties from multiferroicity to superconductivity. This is no doubt a direct consequence of researchers' ability to chemically tune the conventional perovskite unit cell into "$n^{th}$ order" and layered structures. In particular, $Sr_2CuO_4$ is a high-temperature superconductor when a small number of oxygen-vacancies are introduced. Here, we report on another S=1/2 layered perovskite, $Sr_2VO_4$ (n=1 Ruddlesden-Popper phase), which was reported to exhibit an orbital-ordering transition near 100 K from first-principles studies. $Sr_2VO_4$ was synthesized as previously reported [1] and examined using the C2 neutron diffractometer at the Canadian Neutron Beam Centre (CNBC). A wavelength of 2.37 Å was used. Scans were collected at 4 K and 200 K for 24 hours each in the 5 to 85 degree scattering bank. Temperature scans from 95 to 110 K in 1 K steps were performed counting for 4 hours per scan. Unfortunately, no orbital ordering transition was observed despite reports in the literature that report otherwise (Figure 1). Magnetic ordering was also not observed.

**Reference:**

[1] Zhou *et al.* (2007) Phys. Rev. Lett. **99**, 136403.

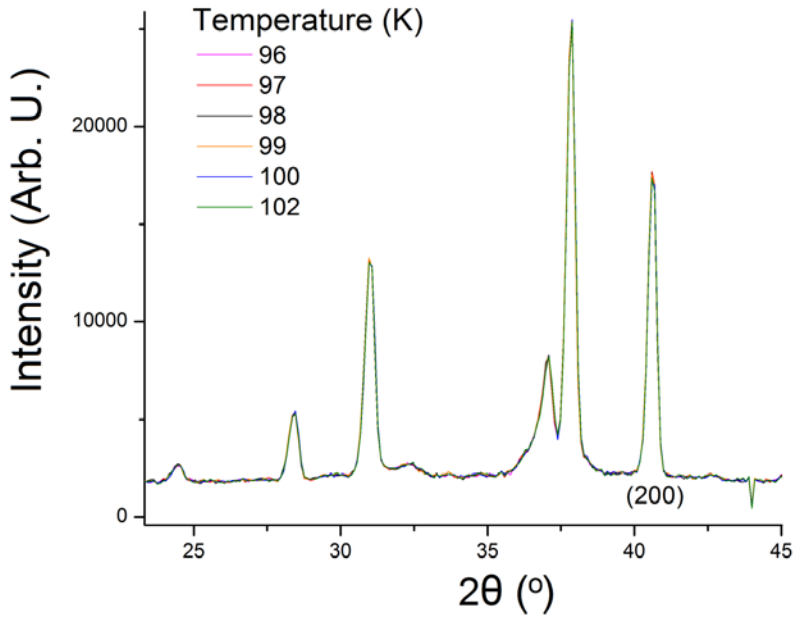


**Figure 1:** Neutron diffractograms of $Sr_2VO_4$ taken at various temperatures on the C2 instrument. No transition was observed as originally reported in [1].