



	Experiment title: Study of the laser induced metastable excited state of the $Na_2[Ru(NO_2)_4(OH)(NO)]$ compound	Experiment number: CH325
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Report:

The experiment consisted of X rays diffraction data collections on a $Na_2[Ru(NO_2)_4(NO)(OH)]$ monocrystal at $50.23KeV$ before and after laser excitation in order to determine laser-induced structural changes. A full data set was measured at **110K** on the non-excited sample with the CCD Siemens area detector system with a sample-detector distance of 5 cm and an exposure time of 5 seconds per frame. The indexing of the data allowed the alignment of the crystallographic b axis parallel to the vertical polarisation direction of the laser light. The b direction corresponds to the direction of the crystal perpendicular to the NO-Ru-OH direction of the molecules and it is therefore the most efficient for the laser excitation. The crystal was then excited for 10 hours at 90K with the 457.9nm line of an argon laser with $50mW/cm^2$ of power density. A full data collection was performed at **110K** after the irradiation.

We observed broadening of Bragg peaks after laser excitation as well as significant differences in some integrated intensities. The space group of the $Na_2[Ru(NO_2)_4(NO)(OH)]$ crystal at **110K** ($P2_1/n$) turned out to be different from that at room temperature ($C2/m$) due to an unknown phase transition. In the figure we show the structure of $Na_2[Ru(NO_2)_4(NO)(OH)]$ at **110K** for the non-excited sample solved for 2667 unique reflections with an agreement factor $R = 4.8\%$. The detailed analysis of the diffraction data of the excited sample is under way.

