

A three months' research visit to the group of Prof. Yuichi Shimakawa at ICR, Kyoto University.

Angel M. Arévalo López

Centre for Science at Extreme Conditions and School of Chemistry, University of Edinburgh.

The idea to come to Japan emerged from a short visit to the Royal Society in London to receive the Daiwa-Adrian prize for the strong and fruitful collaboration between the groups of Prof. Shimakawa (京都) and Prof. Attfield (Edinburgh). During these three months, I had the time to learn some of the differences and similarities between our research approaches, a very valuable knowledge. This stay was partly supported by ICR's Short Term Exchange Program.



My research was focused on the oxidation of the  $\text{Sr}_2\text{CrFeO}_{5.6}$  perovskite at low temperature with a large volume DIA-type high-pressure apparatus (Infinite), to induce high-valent  $\text{Fe}^{4+}$  and  $\text{Cr}^{4+}$  in an ordered structure. Reduction of the original phase with  $\text{CaH}_2$  (topochemical removal of oxygen) led to a vacancy-disordered structure.



I was also applying topochemical reduction techniques to the high-pressure phases  $\text{CaCrO}_3$  and  $\text{SrCrO}_3$  ("Hard-Soft" chemistry) to later re-intercalate hydrogen.

I want to express my sincere gratitude to Prof. Shimakawa for all his help and support during the stay. I also want to thank all the members of the laboratory, especially Saito-sensei and Fabio-san for their prompt advice on the lab-guidelines, use of the equipment, scientific discussions and follow up collaborations. And last but not least, thanks to Abe-san for all her help on the administrative part.

