

Report of my stay in Japan at the Institute for Chemical Research in Kyoto University

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I stayed for 6 months at the Shimakawa-laboratory, in order to accomplish my Master Thesis. Indeed, I'm a French master's student in the University of Montpellier, and I had to complete an internship with the purpose of being graduated from the International Master Program in Materials Science, MaMaSELF.

Thanks to the Kyoto University's young researchers exchange program, which supported my work, I was able to conduct my research on the oxygen diffusion in the Brownmillerite structure compound $\text{Sr}_2\text{ScGaO}_5$. This project is a part of a strong collaboration between Shimakawa group and the group of Prof. Werner Paulus in the Institute of Molecular Chemistry and Materials in Montpellier.

My goal was then to use the Pulsed Laser Deposition technics, in order to obtain thin Films. We focused on the Brownmillerite structure compounds, because this structure shows a high concentration of oxygen vacancies, which is necessary for the diffusion of the Oxygen. Indeed, the structure is described as a perovskite, where $1/6$ of the oxygen atoms are removed from the cubic structure, and recent studies proved that the oxygen can be mobile at a relatively low temperature. The compounds can therefore find application in the solid oxides fuel cells, which is a device that convert air, fuel to electricity without any combustion. My work was focusing on the conductivity measurement, that I did using the 2 probes method, and compare the values for different thin films synthetized under different conditions.

This experience, allowed me to learn different technics of deposition and characterization, and I am very thankful to all my professors who taught me everything I needed to know, and even more. I also learned a lot about the Japanese culture, which is fascinating, and would like to thank the members of the Shimakawa-laboratory for introducing me to the Japanese life. I would like to thanks again the Kyoto University's young research exchange program for founding my work here, and make this opportunity possible.

