



Experiment Proposal

Experiment number GP2022006 Professor Nana Yang, Shanghai Tech University, CHINA Principal investigator **Co-investigator** Ms Cadia D&039;Ottavi, University of Rome Tor Vergata, ITALY **Co-investigator** Professor Elisabetta Di Bartolomeo, University of Rome Tor Vergata, ITALY **Co-investigator** Dr Leonardo Duranti, University of Rome Tor Vergata, ITALY Co-investigator (*) Professor Silvia Licoccia, University of Rome Tor Vergata, ITALY Dr Giovanni Romanelli, University of Rome Tor Vergata, ITALY **Co-investigator** Co-investigator Co-investigator **Co-investigator Experiment title** Influence of exolution phenomena on doped perovskite thin films **SRF Instrument** Parr 4000° Pot./Galv./EIS Days requested: 8 **Access Route** Rapid Access **Previous GP Number: -Science Areas** Chemistry, Energy DOI: -Sponsor: -Sponsored Grant None Grant Title Grant Number: -Start Date Finish Date: -Similar Submission? Industrial Links Non-Technical Abstract

Perovskites exhibit an exceptional variety of properties (ferroelectricity, magnetoresistance, superconductivity) and find application in fuel cells, batteries, catalysis, photocatalysts, thermoelectrics, and solar thermal conversion devices. The high degree of substitutional flexibility and non-stoichiometry makes the perovskites properties highly tunable hence attractive for oxide heterostructure devices with additional electrical and electrochemical functionalities.

The electrical response structural stability can be achieved by tailoring the oxygen stoichiometry using temperature, electrical field, and external environment as driving force. The exsolution of nanoparticles (NPs) at the surface of perovskites may control the lattice defect chemistry under reducing environment at high T. providing the nanomaterials with additional functionalities (electron, ion transport, surface activity etc.) for specific applications and enables resistivity variations likely to the effect of oxygen stoichiometry.

We plan to investigate the homogenous exsolution of Pd NPs in compressive strained La0.6Sr0.4Fe0.9Pd0.1O3- \hat{l} (LSFPd) thin films by means of Electrochemical Impedance Spectroscopy using the PARSTAT 4000A Potentiostat/Galvanostat (located at Unit-Univ Tor Vergata) to gain insights on the possibility of regulating the electrical response of perovskite oxide semiconductors under external stimuli which could be beneficial for the rational design of high-performance functional materials for micro solid oxide fuel cells, nano-sensors, and nano-actuators applications.

Publications

Instruments Access Route Science Areas Sponsored Grant Grant Title Start Date Similar Submission? Industrial Links



Days Requested: Previous RB Number: DOI: Sponsor: Grant Number: Finish Date:





Sample record sheet

Principal contactProfessor Silvia Licoccia, University of Rome Tor Vergata, ITALYSRF InstrumentParr 4000° Pot./Galv./EISDays Requested: 8Special requirements:

SAMPLE

Material	La Sr Fe O Pd mixed oxide	-	-
Formula	La Sr Fe O Pd Mixed oxides	-	-
Forms	Solid		
Volume	10 сс		
Weight	200-500 mg		
Container or substrate	-	-	-
Storage Requirements	-	-	-

SAMPLE ENVIROMENT

Temperature Range	300 - 1000 K	-	-
Pressure Range	1013 - 1013 mbar	-	-
Magnetic field range	- T	-	-
Standard equipment	None	-	-
Special equipment	-	-	-

SAFETY

Prep lab needed	Yes	
Sample Prep Hazards	-	
Special equip. reqs	-	
Sensitivity to air	No	
Sensitivity to vapour	No	
Experiment Hazards	-	
Equipment Hazards	-	
Biological hazards	-	
Radioactive Hazards	-	
Additional Hazards	-	
Additional Details	-	
Sample will be	Returned to user by instrument	
	scientist (when inactive)	

