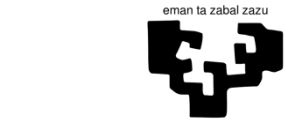
1st Iberian Meeting on Mössbauer Spectroscopy, *IBERMÖSS-2019*

30-31 may 2019

Program

Local Organizing Comittees



Universidad del País Vasco Euskal Herriko Unibertsitatea

ZTF-FCT
Zientzia eta Teknologia Fakultatea
Facultad de Ciencia y Tecnología

Fernando Plazaola Muguruza
Iraultza Unzueta Solozabal
Jose Angel García Martínez
José Javier Saiz Garitaonandía

Welcome to IBERMÖSS-2019

This meeting will be the first joint meeting of the Mössbauer community in the Iberian peninsula. The community is formed by about 10 research teams in Spain and 5 in Portugal that have not had a too fluent communication in the past, neither within Spain nor in the transborder one. The aim of the meeting is to strengthen the communication between the different research teams of this community, in order to pave the roots for further collaboration within the Iberian community.

With the cited aim IBERMOSS2019 will start the 30 of May, Thursday, in Bilbao, with a dinner where the participants will get to know each other and discuss the actual problems and goals of their teams. It will continue on the 31st of May, Friday, with morning and afternoon sessions, in round table format, to discuss different subjects with concern to the research groups of the community, in order to increase their collaboration.

Chairman: F. Plazaola (IBAME's Spanish representative)

Co-chairman: J. C. Waerenborgh (IBAME's Portuguese representative)

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May 30: Starting of the IBERMÖSS-2019 meeting

20:00h Meeting at Bizkaia Aretoa, Bilbao

20:30h Dinner&Discussion. The dinner was at "Bistro of Guggenheim Museum".

May 31: GROUP PRESENTATION and DISCUSSION

MORNING SESSION: **Magnetic, Structural Materials and Biomaterials**

9:30-10:00 **Joao Carlos Waerenborgh**. IST-Universidade de Lisboa,
"*Mössbauer Spectroscopy in Instituto Superior Tecnico, University of Lisboa"*

10:00-10:30 **Jose F. Marco Sanz**. Instituto de Químico-Física "Rocasolano",
"*Mössbauer Spectroscopy in Rocasolano"*

10:30-11:00 **Elies Molins**. ICMAB-CSIC,
"*Mössbauer Spectroscopy at* ICMAB-CSIC"

11:00h Coffee break

11:30-12:00 **Javier Blázquez**. Universidad de Sevilla,
"Two examples of Mössbauer research lines in the University of Sevilla: compositional determination of nanosized microstructural units and kinetic studies on milling induced transformation"

12:00-12:30 **Fernando Plazaola**. UPV/EHU,
"Mössbauer Spectroscopy at UPV/EHU"

13:00 Lunch break

14:00 Election of the Spanish IBAME representative

AFTERNOON SESSION 1: **Catalysis, Films and Environmental Materials**

14.30-15:00 **Javier Rubin**. CSIC-Universidad de Zaragoza,
"Physico-chemical modifications on carbon steel surfaces by laser cleaning"

15:00-15:15 **Iraultza Unzueta**. UPV/EHU,
"*Emission Mössbauer Spectroscopy*"

15:15-15:45 **Benilde Costa**. Universidade de Coimbra,
"*Mössbauer Spectroscopy in Coimbra"*

15:45-16:15 **Pere Bruna Escuer**. Universitat Politècnica de Catalunya,
"Mössbauer Spectroscopy at UPC"

16:15-16:30 **Bruno Vieira**. IST Universidade de Lisboa,
"Mössbauer Spectroscopy applied to Spin Crossover materials"

16:30-16:40 **Guiomar Delgado**. Instituto de Químico-Física "Rocasolano",
"Presentation of poster Awarded in MECAME2019"

AFTERNOON SESSION 2: ***Instrumentation …***

17:00-17:30 **Jose F. Marco Sanz**. Instituto de Química Física "Rocasolano",
"Mössbauer Spectroscopy in electron detection mode"

Conclusions, future perspectives and closing of the meeting

The "2nd Iberian Meeting on Mössbauer Spectroscopy, IBERMÖSS-2021" will take place in Coimbra the second half of January 2021.
It will be organized by Benilde Costa

Strontium hexaferrite platelets: a comprehensive soft X-ray absorption and Mössbauer spectroscopy study

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Strontium ferrite (SFO, $SrFe_{12}O_{19}$) is a ferrite employed for permanent magnets due to its high magnetocrystalline anisotropy. Since its discovery in the mid-20th century, this hexagonal ferrite has become an increasingly important material both commercially and technologically, finding a variety of uses and applications. Its structure can be considered a sequence of alternating spinel (S) and rocksalt (R) blocks. All the iron cations are in the Fe^{3+} oxidation state and it has a ferrimagnetic configuration with five different cationic environments for the iron (three octahedral sites, a tetraedrical site and a bipiramidal site)[1,2].

We have studied the properties of $SrFe_{12}O_{19}$ in the shape of platelets, up to several micrometers in width, and tens of nanometers thick, synthesized by a hydrothermal method. We have characterized the structural and magnetic properties of these platelets by Mössbauer spectroscopy, x-ray transmission microscopy (TMX), transmission electron microscopy (TEM), x-ray diffraction (XRD), vibrating-sample magnetometry (VSM), x-ray absorption spectroscopy (XAS), x-ray circular magnetic dichroism (XMCD) and photoemission electron microscopy (PEEM). To the best of our knowledge this is the first time that the x-ray absorption spectra at the Fe $L_{2,3}$ edges of this material in its pure form have been reported. The Mössbauer results recorded from these platelets both in the electron detection and transmission modes have helped to understand the iron magnetic moments determined by XMCD (*Fig.1*). The experimental results have been complemented with multiplet calculations aimed at reproducing the observed XAS and XMCD spectra at the Fe $L_{2,3}$ absorption edge, and by density functional theory (DFT) calculations to reproduce the oxygen K-absorption edge. Finally the domain pattern measured in remanence is in good agreement with micromagnetic simulations [3].

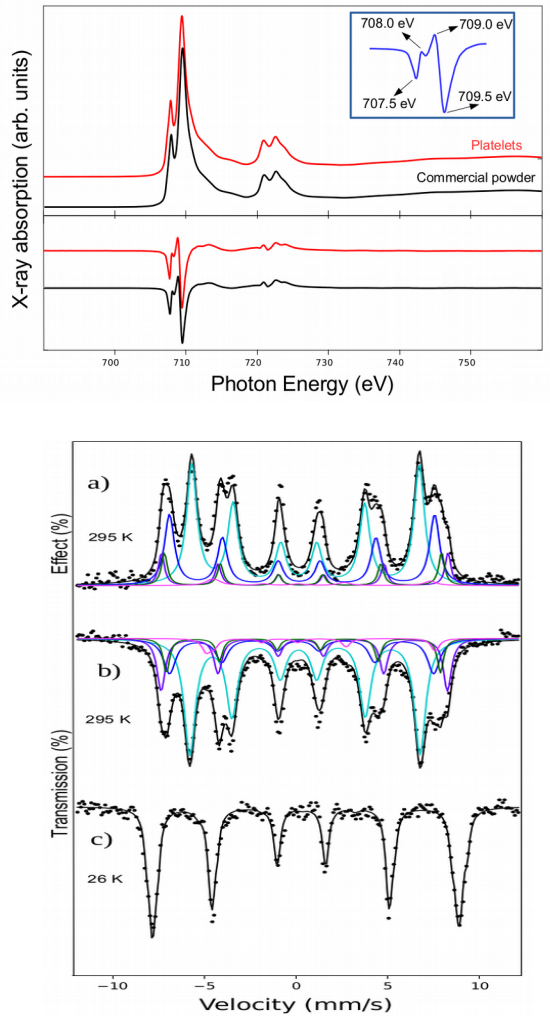

Fig.1 Upper: X-ray absorption spectra and x-ray magnetic circular dichroism spectra at the Fe $L_{2,3}$ absorption edges recorded from the platelets and the commercial powders. Bottom: a), b) and c) Mössbauer spectrum of the SFO platelets in electron detection mode at 295 K and transmission mode at 295 K and at 26 K, respectively.

[1] V.A.M Brabers, Handbook of Magnetism and Advanced Magnetic Materials, (2007), pp 1-19.
[2] R.C. Pullar, Progress in Materials Science 57 (2012), pp 1191–1334.
[3] G. D. Soria et al. (Scientific Reports, submitted)