

# INDUSTRIAL APPLICATIONS OF MÖSSBAUER SPECTROSCOPY

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In the last few years great attention has been devoted to the study and engineering of innovative functional materials useful for industrial applications (metallurgy, catalysis, biotechnology, mineralogy, electrochemistry and tribology) as well as to the development of low dimensional systems for the microelectromechanical and information/energy storage devices (MRAM, ion battery, nanotechnology, nuclear and renewal energy). The analysis and optimization of the material properties in view of their particular field of application require a number of complementary and finalized techniques which in many cases are not sufficiently locally sensitive and selective.

In this regard, the Mössbauer Spectroscopy is a very powerful tool allowing a lot of industrial applications thanks to the possibility to obtain, simultaneously, information on composition, crystallographic phases and magnetic properties with a very high local sensitivity. This technique can be performed in different geometry, varying the measurement temperature, and selecting the resonant particle and his energy allowing depth-selective analyses and the study of interface phenomena in low dimensional systems. Moreover, the non-destructive character of the Mössbauer spectroscopy makes this technique suitable also for applications in the field cultural heritage.

The present lecture will evidence the great versatility and high capability of the Mössbauer Spectroscopy and a few examples will be presented pointing out its actual usefulness in the industrial Research and Development, as well as its suitability for applications in fields of technological interest.

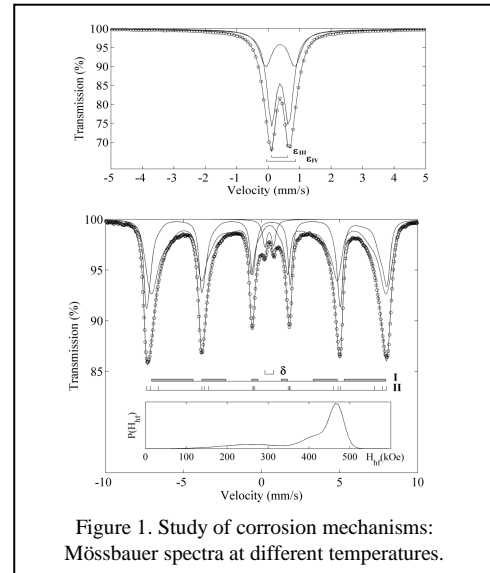


Figure 1. Study of corrosion mechanisms: Mössbauer spectra at different temperatures.

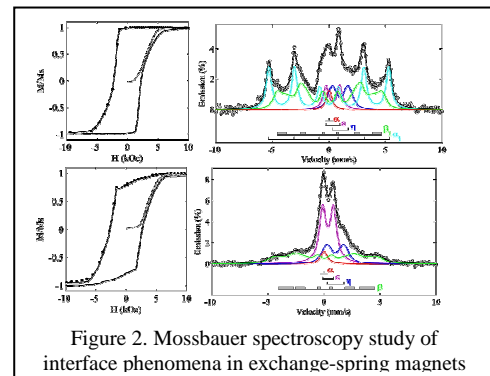


Figure 2. Mossbauer spectroscopy study of interface phenomena in exchange-spring magnets