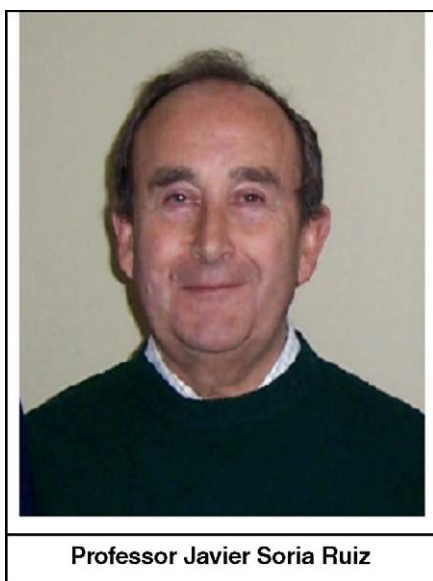




Preface



On behalf of the colleagues, postdoctoral and graduate students that have had the privilege to work with Professor Javier Soria throughout his fruitful and extensive career, we are pleased to dedicate this special issue of *Catalysis Today* to celebrate his scientific contributions on the occasion of his retirement.

Professor Javier Soria Ruiz was born in 1939 in a small village of the Zaragoza (Saragossa for English speakers) province (Spain), where his father was a medical doctor. He attended the Zaragoza University where he received his BS degree in Physics in 1962. Supported by his excellent grades, he got a research grant at the Spanish Research Council (CSIC) and moved for the first time to the city of Madrid, where he settled and developed most of his scientific career. There, he began doctoral studies under the supervision of Professors Juan F. García de la Banda and Jesús A. Pajares. In 1966 he received his Ph D in Physics from the Complutense University in Madrid with a dissertation about the electrical properties of Cr_2O_3 . Soon afterwards he was awarded a research fellowship in Cambridge University (UK). He spent two years in this prestigious university, where he studied mechanical properties of solids under the supervision of Professor P.G. Fox and obtained a second doctorate in Physics in 1968 with a thesis on the thermal decomposition of brittle solids. Those were difficult times

for Spanish science, with the country still very isolated and unconnected from the international forums. Fortunately, in late 1960's a pioneering generation of Spanish researchers started to travel abroad, and in this way contributed to reconstruct the relationships with most influential foreign scientific institutions. In this respect, the professional trajectory of Professor Javier Soria is a good example, because he enrolled as a research associate at Princeton University (New Jersey, USA) in 1969 with Professor John Turkevich. During this time he acquired experience in the application of the electron spin resonance technique (ESR) to the study of paramagnetic cations dispersed in zeolite networks [1]. Later, these studies would be revealed as a cornerstone of his career, because Professor Soria has become a renowned expert in the application of ESR to the study of catalytic systems [1–7].

Shortly after his return to Madrid in 1970, he was appointed as a tenured scientist at the Catalysis Department of the “Rocasolano” Institute of Physical Chemistry of the CSIC. This department, then directed by Professor Juan Francisco García de la Banda, was the origin of the Institute of Catalysis and Petroleum Chemistry (ICP-CSIC), which was established as a separate research centre in 1975. There Javier Soria got a full professor position in 1984. The connection of Professor Soria with this institution became even more profound in 1989, when he was appointed Head of the Institute. This happened at a crucial period in the short but successful history of this research centre, because in 1991 and under his supervision a new building for it was inaugurated in the Cantoblanco Campus in Madrid, to house a growing number of research teams devoted to the study of most fields involved in the catalysis area. Until 2002, Professor Soria dedicated a large amount of time and effort to the management of this Institute, which nowadays is consolidated as a worldwide reference centre for catalytic studies. During this period, Professor Javier Soria was also a member of the Scientific Committee of International Conference on Catalysis (1990–1994) and Spanish representative in the International Union for Vacuum Science Technique and Applications (1986–1995). More recently, Professor Soria has been member of the consulting committee of experts in Energy of the Spanish Government (2000–2007), and currently he belongs to the scientific board of the Madrid Institute for Advanced Studies in Energy (IMDEA-Energy).

In addition to his participation in book chapters and numerous contributions to conferences, Professor Soria has co-authored more than 225 academic articles, which, up to date, have been cited over 4000 times, leading to a Hirsch index $h = 37$, according to the Institute for Scientific Information (ISI) Web of Science. He has been member of the organising committee of several conferences

and meetings on catalysis and surface science (among which, being main organizer of the 7th International Symposium on Magnetic Resonance in Colloid and Interface Science, Madrid 1995), and has presented more than 50 communications to international conferences. He is also co-inventor of two patents and has supervised 15 PhD students. Since then several of his former students have become professors themselves, and many of them are among the authors contributing to this special issue.

Although his research was initially focussed on solid state chemistry, mainly on the study of mechanical and electrical properties of transition metal oxides, his interest on catalysis began in the early 1970's, during his stay in Princeton University. Back in Madrid, during the foundational period of the Catalysis Institute, Professor Soria was involved in research projects on catalysis which approached a great variety of topics, including the spectroscopic characterization of zeolites, the heterogeneization of homogeneous and enzymatic catalysts, or the study of the strong metal-support interactions (SMSI) in supported noble metal catalysts [2]. In the late 1970's, a few years after the oil crisis prompted a renewed interest in the development of alternative power sources, Professor Soria was involved in several projects for the photocatalytic production of hydrogen, but his dedication to the study of photocatalysis has been a lifelong interest [3–8]. In this field he has had numerous collaborations with many recognized groups working in this field as the contributions to this special issue suggest. Among all of them we could highlight the cooperation with the Materials Science groups at Seville University and CSIC [3,4] and the Chemical Engineering groups of the Hong-Kong University of Science and Technology [6,7] and the University of Palermo (Italy) [5,8]. These collaborations have allowed establishing remarkable synergies between the engineering and physicochemical aspects of semiconductor photocatalysis. The study of the catalytic properties of other reducible metal oxides like CeO_2 or $\text{Ce}_{1-x}\text{Zr}_x\text{O}_2$ have been also subject of Professor J. Soria investigations. In this respect, the molecular details of the processes occurring in catalytic converters used in automobile emissions control are another of the environmental applications which have been extensively addressed by Professor Soria in the last years. In all these fields, the expertise of Professor Soria on ESR spectroscopy has been a notable advantage to gain information about certain molecular aspects of catalysis which has been otherwise rarely approached. On this regard, the study of the formation of oxygenated radicals on TiO_2 photocatalysts [3,4,7] and the investigation of oxygen vacancies in CeO_2 -containing catalysts used for the automobile emissions control [9,10] are possibly among the most remarkable scientific contributions of Professor Soria and his collaborators.

Considering this background, it is not a surprise that important issues of environmentally relevant catalysis, like fuel cells, photocatalysis and automobile emission control, are well represented in the contributions to this Festschrift issue. In fact, we believe that this collection of articles, which comprise contributions from topics as diverse as quantum mechanical calculations

and environmental engineering, perfectly illustrate the interest of Professor Soria in linking fundamental and practical aspects of catalysis. On this regards, it is worth emphasising his dedication to establishing bridges between the knowledge of the molecular scale aspects of catalysis, as obtained from spectroscopic techniques, and the practical applications that the society demands, like the development of efficient systems for pollutant emission control or for a better use of the energy resources; this effort has been indeed very well appreciated by all those who have collaborated with him along his scientific life. However, for all those who know him closely the most remarkable qualities of Professor Soria are surely his good temper and his modest, quiet and polite character.

Finally, we would like to express our gratitude to all authors for their enthusiasm and patience and to the reviewers for their useful and thorough comments. We also want to thank Professor Julian Ross and Ms. Rosie Malone of the Editorial Staff of *Catalysis Today* for making this special issue possible.

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Available online 23 January 2009