

CURRICULUM VITAE

PERSONAL DATA

Last Name: **SERNA PEREDA** SEX: **Male**
Name: **CARLOS J.** Born: **14-02-1948 (Granada, Spain)**
Address: **Instituto de Ciencia de Materiales (CSIC)**
Colloids and Surface Chemistry Group, Department of Biomaterials and Biomimetic
Materials
Cantoblanco, 28049 Madrid
Phone: **913349077**; Fax: **913720623**; email: **CJSERNA@ICMM.CSIC.ES**
PRESENT POSITION: Profesor de Investigación (Full Professor)

EDUCATION (Degrees)

Sc. B. (1970) University of Granada
Doctor(PhD) in Chemistry(1974) Universidad Complutense, Madrid

EXPERIENCE IN RESEARCH

- Fulbright Fellow at the Universities of Michigan and Purdue,USA (1975-1976)
 - Research Assistant at Purdue University, USA (1977)
 - Investigador Científico(Senior Research Scientist) at the CSIC, Spain(1980-85)
 - Profesor de Investigación (Full Professor) at the CSIC, Spain (1985-present)
-

Main Research Interest

- Preparation and Colloidal properties of uniform particles (monodispersed)
 - Mechanisms of formation of particles in solution
 - Magnetic and Optical properties of nanoparticles
-

SOME SCIENTIFIC PUBLICATIONS (2008-2012)

1. Mendoza-Reséndez, R.; Luna, C.; Barriga-Castro, E. D.; Bonville, P.; **Serna, C. J.** Control of crystallite orientation and size in Fe and FeCo nanoneedles. *Nanotechnology* **2012**, *23* (22), 225601.
2. Cabrera, L.; Somoza, +.; Marco, J.; **Serna, C.J.**; Puerto Morales, M. Synthesis and surface modification of uniform MFe₂O₄ (M = Fe, Mn, and Co) nanoparticles with tunable sizes and functionalities. *Journal of Nanoparticle Research* **2012**, *14* (6), 1-14.
3. Andrés-Vergés, M.; del Puerto Morales, M.; Veintemillas-Verdaguer, S.; Palomares, F. J.; **Serna, C. J.** Core/Shell Magnetite/Bismuth Oxide Nanocrystals with Tunable Size, Colloidal, and Magnetic Properties. *Chem. Mater.* **2011**, *24* (2), 319-324.
4. Gutiérrez, L.; Mejías, R.; Barber, D. F.; Veintemillas-Verdaguer, S.; **Serna, C. J.**; Lázaro, F. J.; Morales, M. P. Fighting cancer with magnetic nanoparticles and immunotherapy. Parak, W. J., Yamamoto, K., Osinski, M., Eds.; 2012.
5. Tartaj, P.; Morales, M. P.; Gonzalez-Carreño, T.; Veintemillas-Verdaguer, S.; **Serna, C. J.** The Iron Oxides Strike Back: From Biomedical Applications to Energy Storage Devices and Photoelectrochemical Water Splitting. *Adv. Mater.* **2011**, *23* (44), 5243-5249.
6. de Castro, V.; Benito, G.; Hurst, S.; **Serna, C. J.**; Morales, M. P.; Veintemillas-Verdaguer, S. One step production of magnetic nanoparticle films by laser pyrolysis inside a chemical vapour deposition reactor. *Thin Solid Films* **2011**, *519* (22), 7677-7682.
7. Gutiérrez, L.; Mejías, R.; Barber, D. F.; Veintemillas-Verdaguer, S.; **Serna, C. J.**; Lázaro, F. J.; Morales, M. P. Ac magnetic susceptibility study of in vivo nanoparticle biodistribution. *Journal of Physics D: Applied Physics* **2011**, *44* (25), 255002.
8. Mejías, R.; Pérez-Yagüe, S.; Gutiérrez, L.; Cabrera, L. I.; Spada, R.; Acedo, P.; **Serna, C.J.**;Lázaro, F. J.; Villanueva, Á.; Morales, M. d. P.; Barber, D. F. Dimercaptosuccinic acid-

coated magnetite nanoparticles for magnetically guided in vivo delivery of interferon gamma for cancer immunotherapy. *Biomaterials* **2011**, 32 (11), 2938-2952.

9. Batlle, X.; Perez, N.; Guardia, P.; Iglesias, O.; Labarta, A.; Bartolome, F.; Garcia, L. M.; Bartolome, J.; Roca, A. G.; Morales, M. P.; **Serna, C. J.** Magnetic nanoparticles with bulklike properties (invited). *Journal of Applied Physics* **2011**, 109 (7), 07B524-07B526.
10. Cañete, M.; Soriano, J.; Villanueva, A.; Roca, A. G.; Veintemillas-Verdaguer, S.; **Serna, C. J.**; Miranda, R.; Morales, M. P. The endocytic penetration mechanism of iron oxide magnetic nanoparticles with positively charged cover: A morphological approach. *International Journal of Molecular Medicine* **2012**, 26 (4), 533-539.
11. Mejías, R.; Pérez-Yagüe, S.; Roca, A. G.; Pérez, N.; Villanueva, A.; Cañete, M.; Mañes, S.; Ruiz-Cabello, J.; Benito, M.; Labarta, A.; Batlle, X.; Veintemillas-Verdaguer, S.; Morales, M. P.; Barber, D. F.; **Serna, C. J.** Liver and brain imaging through dimercaptosuccinic acid-coated iron oxide nanoparticles. *Nanomedicine*. 5[3], 397-408. 2010.
12. Michel, F. M.; Barrón, V.; Torrent, J.; Morales, M. P.; **Serna, C. J.**; Boily, J. F.; Liu, Q.; Ambrosini, A.; Cismasu, A. C.; Brown, G. E. Ordered ferrimagnetic form of ferrihydrite reveals links among structure, composition, and magnetism. *Proceedings of the National Academy of Sciences* **2010**, 107 (7), 2787-2792.
13. Cabrera, L. I.; Somoza, A.; **Serna, C. J.**; Morales, M. P. Synthesis of MFe₂O₄ (M = Fe, Mn) Nanoparticles with Tunable Sizes. AIP: 2010; pp 13-16.
14. Alexandrescu, R.; Bello, V.; Bouzas, V.; Costo, R.; Dumitrache, F.; Garcia, M. A.; Giorgi, R.; Morales, M. P.; Morjan, I.; **Serna, C. J.**; Veintemillas-Verdaguer, S. Iron Oxide Materials Produced by Laser Pyrolysis. AIP: 2010; pp 22-25.
15. Alexandrescu, R.; Bouzas, V.; Costo, R.; Dumitrache, F.; García, M. A.; Morales, M. P.; Morjan, I.; **Serna, C. J.**; Veintemillas-Verdaguer, S. Reproducibility of the Synthesis of Iron Oxide Nanoparticles Produced by Laser Pyrolysis. American Institute of Physics: 2010; pp 30-32.
16. Gutiérrez, L.; Cabrera, L. I.; Mejías, R.; Barber, D. F.; **Serna, C. J.**; Morales, M. P. Magnetic Nanoparticle Location and Quantification in Mice Tissues after Intravenous Injection. American Institute of Physics: 2010; pp 141-144.
17. Roca, A. G.; Costo, R.; Rebolledo, A. F.; Veintemillas-Verdaguer, S.; Tartaj, P.; González-Carreño, T.; Morales, M. P.; **Serna, C. S.** Progress in the preparation of magnetic nanoparticles for applications in biomedicine. *Journal of Physics D: Applied Physics* **2009**, 42 (22), 224002.
18. Gonzalez-Fernandez, M. A.; Torres, T. E.; Andrés-Vergés, M.; Costo, R.; de la Presa, P.; **Serna, C. J.**; Morales, M. P.; Marquina, C.; Ibarra, M. R.; Goya, G. F. Magnetic nanoparticles for power absorption: Optimizing size, shape and magnetic properties. *Journal of Solid State Chemistry* **2009**, 182 (10), 2779-2784.
19. Roca, A. G.; Niznansky, D.; Poltiero-Vejpravova, J.; Bittova, B.; Gonzalez-Fernandez, M. A.; **Serna, C. J.**; Morales, M. P. Magnetite nanoparticles with no surface spin canting. *Journal of Applied Physics* **2009**, 105 (11), 114309-7.
20. Roca, A. G.; Veintemillas-Verdaguer, S.; Port, M.; Robic, C.; **Serna, C. J.**; Morales, M. P. Effect of Nanoparticle and Aggregate Size on the Relaxometric Properties of MR Contrast Agents Based on High Quality Magnetite Nanoparticles. *J. Phys. Chem. B* **2009**, 113 (19), 7033-7039.
21. Villanueva, A.; Cañete, M.; Roca, A. G.; Calero, M.; Veintemillas-Verdaguer, S.; **Serna, C. J.**; Morales, M. P.; Miranda, R. The influence of surface functionalization on the enhanced internalization of magnetic nanoparticles in cancer cells. *Nanotechnology* 2009, 20 (11), 115103.
22. Perez, N.; Bartolome, F.; Garcia, L. M.; Bartolome, J.; Morales, M. P.; **Serna, C. J.**; Labarta, A.; Batlle, X. Nanostructural origin of the spin and orbital contribution to the magnetic moment in Fe_{3-x}O₄ magnetite nanoparticles. *Applied Physics Letters* **2009**, 94 (9), 093108-3.

23. Cabello, E.; Morales, M. P.; **Serna, C. J.**; Barrón, V.; Torrent, J. Magnetic enhancement during the crystallization of ferrihydrite at 25 and 50°C. *Clays and Clay Minerals* **2009**, *57* (1), 46-53.
24. Pérez, N.; Guardia, P.; Roca, A. G.; Morales, M. P.; **Serna, C. J.**; Iglesias, O.; Bartolomé, F.; García, L. M.; Batlle, X.; Labarta, A. Surface anisotropy broadening of the energy barrier distribution in magnetic nanoparticles. *Nanotechnology* **2008**, *19* (47), 475704.
25. Mejías, R.; Costo, R.; Roca, A. G.; Arias, C. F.; Veintemillas-Verdaguer, S.; González-Carreño, T.; del Puerto Morales, M.; **Serna, C. J.**; Mañes, S.; Barber, D. F. Cytokine adsorption/release on uniform magnetic nanoparticles for localized drug delivery. *Journal of Controlled Release* **2008**, *130* (2), 168-174.
26. Vergés, M. A.; Costo, R.; Roca, A. G.; Marco, J. F.; Goya, G. F.; **Serna, C. J.**; Morales, M. P. Uniform and water stable magnetite nanoparticles with diameters around the monodomain-multidomain limit. *Journal of Physics D: Applied Physics* **2008**, *41* (13), 134003.
27. de Castro, V.; Benito, G.; Hurst, S.; Cebollada, F.; **Serna, C. J.**; Morales, M. P.; Veintemillas-Verdaguer, S. Functionalisation of Glass with Iron Oxide Nanoparticles Produced by Laser Pyrolysis. *Journal of Nanoscience and Nanotechnology* **8**[5], 2458-2462.

Lectures (invited)

- 205th Amer. Chem. Soc. National Meeting (1993) Denver (USA).
- Inter. Workshop on Ceramic Science and Technology. (1994) Ankara (Turkia).
- Nato Advance Research Workshop (1995) Maratea (Italia)
- 5Th European Conference on Advance Materials, (1997) (Ceramic Symposium), (Maastricht.)
- IR characteristics of amorphous silica powders. (1997) CEA ,Saclay(Francia).
- Magnetism of nanostructure phases (1998) Chairman ,(San Sebastian.)
- Magnetic Properties of Fine Particles ,3rd Euroconference (1999) (Barcelona)
- Técnicas de preparación de nanopartículas en Biomedicina(2004) Un.Rey Juan Carlos (Aranjuez)
- Síntesis de nanopartículas magnéticas (2005) Universidad Complutense (Madrid)
- International Workshop on Nanostructure Materials (2006) Antalya (Turkia)
- Intern. Workshop on Magnetic Nanosystems for Biotechnology . Chairman (2007) (Madrid)
- Shape and size control of particles through synthesis. (2009) (European Training Action)CSIC (Madrid)

OTHER ACTIVITIES

- Scientific Coordinator of the Material Science Area ,CSIC (1992-1994)
- Research prize of the “ Domingo Martinez” Foundation, 1995
- Member of the Commission of the Material Science Area, CSIC (1996-8)
- Head of the Department “Materiales Particulados” , ICMM (1996-8)
- More than 175 scientific publications in international Journals and 9 PhD Theses
- More than 6904 references in the scientific literature (H= 46)