



In The Name of God  
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**Title: Design, Synthesis and Applications of nanoparticles**

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Nanotechnology, a rapidly growing science, is focused on the integration of fields such as physics, biology, engineering, chemistry, computer science and others. Over a few years the use of nanoparticles has brought a new era to the field of industry based on their unique optical, electronic, photonics, magnetic, biologic, catalytic properties. Many of the nanomaterials developed have already had a high impact on health care. Nanoparticles have shown an ability to improve pharmacokinetics, pharmacodynamics and to reduce the toxicity of associated drugs [1].

In our studies, due to potential applications of nanoparticles in medical diagnostics, imaging, and therapeutic treatments, in optoelectronics and data storage, designing and synthesizing of nanoparticles was studied and a variety of nanoparticles of different structural and chemical formulations have been tested for their target specificity such as drug carrier systems [2-8].

Also, we introduced new efficient and environmentally friendly reagents in the synthesis of nanoparticles. In these methods, the relative rates between nucleation and growth of nanoparticles are well controlled by choosing an efficient reducing as well as a capping agent and nanoparticles are formed with various interesting chemical and physical properties [9,10].

**References:**

1. N.R. Panyala, E.M. Peña-Méndez, J. Havel, *J. Appl. Biomed.* 7 (2009) 75-91.
2. H. Eshghi, A. Sazgarnia, M. Rahimizadeh, N. Attaran, M. Bakavoli, S. Soudmand, *Photodiagnosis Photodyn. Ther.* 10 (2013) 304-312.
3. H. Eshghi, N. Attaran, A. Sazgarnia, N. Mirzaie, A. Shanei, *International Journal of Nanotechnology* 8 (2011) 700-11.
4. A. Amiri, M. Memarpour-Yazdi, M. Shanbedi, H. Eshghi, *Journal of Biomedical Materials Research Part A*, 101 (2013) 2219-2228.
5. A. Sazgarnia, A. Shanei, A.R. Taheri, N. Tayyebi Meibodi, H. Eshghi, N. Attaran, M.M. Shanei, *Journal of Ultrasound in Medicine*, 32 (2013) 475-483.
6. S.A. Rounaghi, H. Eshghi, A.R. Kiani Rashid, J. Vahdati Khaki, M. Samadi Khoshkhoo, S. Scudino, J. Eckert, *Journal of Solid State Chemistry*, 198 (2013) 542-547.
7. S.A. Rounaghi, A.R. Kiani Rashid, H. Eshghi, J. Vahdati Khaki, *Journal of Solid State Chemistry*, 190 (2012) 8-11.
8. A. Amiri, M. Shanbedi, H. Eshghi, S. Zeinali Heris, M. Baniadam, *Journal of Physical Chemistry C*, 116 (2012) 3369-3375.
9. H. Eshghi, M. Rahimizadeh, N. Attaran, M. Bakavoli, *J. Iran. Chem. Soc.* 10 (2013) 1151-1157.
10. A. Sazgarnia, A. Shanei, H. Eshghi, M. Hassanzadeh-Khayyat, H. Esmaily, M.M. Shanei, *Ultrasonics*, 53 (2013) 29-35.