

New method suggested for production of polymeric nanocarriers used in medical industries

IRANIAN researchers from Amirkabir University of Technology produced polymeric nanocarriers that can be used in pharmaceuticals and medical industries.

The researchers proposed a new method for the production of medical nanocarriers that does not require complicated chemical reactions and enables the production of the product only in one step.

In recent years, numerous researches have been carried out on the production of multi-functional polyethylenes with chain-type structure and controlled molecular weight. In this research, multifunctional polyethylene nanoparticles were synthesized by using Brookhart's palladium catalysts (based on diamine ligands), and their performance in drug release has been studied.

The produced nanoparticles in this research are made of multifunctional polyethylene, that is completely hydrophobic and it is produced in one step. Unlike linear samples, these particles are soluble in normal organic solvents such as tetrahydrofuran and chloroform. These nanoparticles are about 30 nm in size, and they create nanocarriers at 50-200 nm after self-arrangement. In addition, many studies have proved that the amount of capsulated drug is higher in multifunctional polymers than in their linear family members.

Olefinic nature of the core of the produced nanoparticle enables it to carry significant amount of the hydrophobic drug, and it causes the release to take place in a longer period. On the other hand, when the drug is loaded in the nanoparticles, they become much less toxic to healthy cells, and the time for entrapping the drug increases.