Abstract

In order to investigate the stability of iron nanoparticles in calcareous soils, a factorial experiment was conducted in a completely randomized design with 3 replications in the Soil Laboratory and also in the Agricultural Biotechnology Research Institute of Zabol University in 1395-96. The treatments consisted of 6 iron nanoparticles (nanoparticles synthesized with lavender and parasite plant extract, nanoparticles synthesized with vegetable oil of grape and sesame seeds, synthetic nanoparticles with crabs and saliva of snails) with control in 5 different soils (In terms of lime content). Based on the results, it was found that soil limestone is not the only determining factor in iron absorption, so that from 5 soils with lime content of 8 and 11/5 and 14/5, 20 and 22/5 percent was expected By increasing the amount of lime, the amount of iron absorption decreases. The results show that with the increase in the amount of limestone in the soil (soil with lime content 14/5 %) Contrary to expectations, attraction has increased. so that in the soil with a scale of 8 percent, It reached synthetic nanoparticles with crabs treatment rate of 4/53 mg / kg to 2/37 mg / kg in soil with lime content of 11/5 %. In the soil with a scale of 14/5 percent, this rate, contrary to the decline trend, has increased and reached to 10/07 mg / kg. Then, in the soil with limestone content of 20 %, it was again reduced and up to 4/51 mg / kg and this number reached in the soil with limestone content of 22/5 %, to 1/91 mg / kg. therefore, it was found that some physical and chemical properties of soil with limestone content of 14/5 %, the soil has a larger amount of clays and silt (order 42/4 and 52) than the rest of the soils. It also has a higher organic carbon content, is more (1/24) than the rest of the soils, more organic matter content (2/1) of the rest of the soils and cationic exchange capacity is 12/5, which is higher than the rest of the soils. Therefore alone, the limestone element does not affect the ability to absorb iron and the rest of the soil characteristics, including organic carbon and the cation exchange capacity and organic matter, are important. Also, due to the regression results, showed that nanoparticles stability was increased in soils with greater clay and organic matter and cationic exchange capacity. Also, according to the Scanning electron microscopy analysis (SEM) performed on nanoparticles, it can be stated that the nanoparticle synthesized with natural sesame oil has morphologically produced nanoparticles with less fusibility and smaller particles than other nanoparticles. Also, the x-ray diffraction pattern analysis (XRD), which is based on the structure, sex, and elemental values, shows that the specimen produced in sesame oil has the purest compound with the least impurity peak. So, the mixture made with natural sesame oil is better than other compounds.

Key words: Nanotechnology, Iron nanoparticles, Stability, Calcareous soil

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