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Determination the concentrations and the Transfer Factor for uranium in the Phosphorous Fertilizers from soil to plants by using Nuclear Track Detector (CR-39)

A thesis

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ABSTRACT

The aim of this research was to study the concentrations and the Transfer factor for Uranium in the phosphorus fertilizers from soil to plants using Nuclear track detector (CR-39).

Our present investigation is based on the study of 10 types samples from different kinds of phosphorus fertilizers which was available in the local market

Some of them were Iraqi made and the others from different countries like, (Iran, Italy, Holland, Lebanon and Jordan) and then found the uranium concentrations on it.

Then we have obtained the Uranium concentrations in soil samples mixed with phosphorus fertilizers which were used to grow up the plants and also obtained the Uranium concentrations in the plants At last we obtained the Transfer factor of Uranium from soil to plants to knew the amount of Uranium which was transfer to the plants.

In fission track method, samples (1 gm) were pressed in to a pellet of (1.8 cm) diameter and (2 mm) thickness.

The pellet was covered with small strips of (CR-39) poly carbonate track detector on both sides .

The pellet placed in a plate of paraffin wax at a distance of [5cm] from (^{241}Am- Be) neutron source with thermal neutron flux(5000n.cm^{-2}.s^{-1}) for seven days.

After irradiation time ,CR-39 track detectors were etched by using solution liquid (NaOH) in normalization (6.25N) at 60C° for (6hrs)

The result obtained shows that the Uranium concentration in phosphorus fertilizers samples varies from (3.51ppm) to(2.59ppm).

And in the soil mixed with phosphorus fertilizers samples varies from (2.48ppm) to (2.06ppm).

And the plants varies from (1.98ppm) to (1.70ppm) in the Radish plant, and varies from (1.68ppm) to (1.17ppm) in the Peppergrass plant. And varies from (1.39ppm) to (1.04ppm) in the Vegetal plant.

The result of the Transfer Factor varies from(0.86) to (0.77) in the Radish plant, and(0.73) to (0.62) in the Peppergrass plant, and(0.63) to (0.44) in Vegetal plant.

Based on the radioactive concentration of Uranium in the samples all the results obtained are within the international levels as given by IAEA (International atomic Energy Agency) date.