

EFFECTS OF DIFFERENT LEVELS OF BIOFERTILIZER *Trichoderma harzianum* IN SOME THERMODYNAMIC PARAMETERS OF POTASSIUM.

Thuraya Khalaf Badawi AL- Jubory

*Dept. of Geography–College of Basic Education–Univ. of Diyala. tkbs1234@yahoo.com

ABSTRACT

The Purpose of this study is to investigate the effect of biofertilizer fungus *T. harzianum* in some thermodynamic parameters of potassium, include activated and activity coefficient, free energy ΔF , and proportion activity of potassium to activate of calcium and magnesium A. This experiment was conducted in factored experiment which used pots and (*Vigna radiate L.*) as indicator, plant which planted in sandy clay loam soil. This experiment included 10 treatments, resulted from interaction between factors of sterilized and unsterilized soil, with five levels of inoculums fungi 0.0, 0.5, 1.0, 2.0, and 3.0 g. in three replicates.

The soil samples were taken in two periods the first one before planted, which included soil physical and chemical estimate of some thermodynamics parameters of potassium analysis, valuated the potassium thermodynamic standard, where as the second one was carried out after planted. The results were as follows.

significant difference of unsterilized soil comparing with sterilized soil which increased the activity coefficient of potassium to 0.82 and 0.78 respectively, and significant results of unsterilized soil in 3.0 g level comparing of the other treatments which increased the factor of potassium activity to 0.83.

Significant difference of unsterilized soil comparing with sterilized soil, which increased the activity coefficient, and significant difference of potassium were 36.40, 26.56 mol/L respectively and significant difference of fertilizer levels, to 2.0, 3.0 g comparing with other fertilization levels of increased the potassium coefficient. Whereas the interaction which significant difference of two treatment of unfertilized soil and two levels fertilizations 2.0, 3.0 g. comparing with the other treatment were 43.48, 42.97 mol - L⁻ respectively. The sterilized soil lead to increase the value of negative free energy, comparing with unfertilized soil were -5700 and -5150 cal.mol⁻ respectively. Appearing significant difference between fungus concentrations on free exchange energy values. which were significant difference of two levels 2.0, 3.0 g comparing with fertilized levels which decreased negative values of free energy exchange of potassium which were -4100 and -4000 cal.mol⁻ respectively. As for interaction were significant s of two treatments of unsterilized soil in 2.0 and 3.0 g comparing with the other treatment which were -3900 and -3600 cal.mol⁻.

The value of ARK were decreased after planted in both sterilized and unsterilized soil to 0.40 and 0.47 mol.L^{-1/2} Respectively, which decreased in unsterilized soil was slightly , comparing with the values of ARK before planted 0.49 mol.L^{1/2} were the average of activity ionic of potassium for biofertilized 0.0--3.0 (0.37 - 0.51) mol.L^{-1/2} respectively .This results of chemical movement voltage of potassium related to chemical movement voltage calcium and magnesium ions in soil .

The average of ARK which relatively high values , indicate that proportion of potassium activity to magnesium and calcium were very high . The fertilized by *T.harzianum* increased potassium contents comparing with calcium and magnesium.The higher values of ARK 0.55 mol.L^{-1/2} resulted from interaction for the soil unsterilized soils in the fifth level of biofertilizer 3.0 g.

Key words: Biofertilizer,*T.harzianum fungus*, Some stander of potassium thermodynamic