



## ALKALINE STABILIZATION OF SLUDGE FROM TREATMENT PLANT OF WASTEWATER FOR USE IN SOIL IMPROVEMENT

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**Introduction.** The treatment of alkaline stabilization of sludge from of wastewater treatment plants in countries of Europe and E.U.A., system based on the EPA40 CFR Part 503, Standards for the use and disposal of sewage sludge, (the Part 503 Rule)<sup>(1)</sup>, decreased the concentration of pollutants and pathogenic microorganisms, still useful as biofertilizer in disturbed ground, due to its high content of nutrients and having impact on the population and environment<sup>(2)</sup>. In Mexico, waste and disposal of sewage sludge are regulated by the NOM-004-SEMARNAT-2002<sup>(3)</sup>, however, the research on the stabilization of sludge are short of<sup>(2)</sup>.

The objective was the stabilization of sludge treatment plant for Sewage for use as breeder of forestry or agricultural soils.

**Methodology.** The sludge were obtained from the primary treatment of urban water. They were subjected to a process of stabilization alkaline with Ca(OH)<sub>2</sub> to different concentrations (0 %, 25 %, 50% and 100 % ), for a period of contact and follow-up to 13 days, on day 0 was applied the alkalizing. To each treatment was determined the temperature (thermometer bulb), pH (method potentiometric), humidity (N MX-AA-16-1984), coliforms fecal (NMX-AA-042-1987) and helminth eggs, on the basis of the NOM-004-SEMARNAT-2002 and the EPA832-F-00-052 September 2000.

**Results.** The data of the alkaline stabilization of sludge during 13 days of follow-up, show that the treatments with a concentration of 50 and 100% of Ca(OH)<sub>2</sub> the pH is above 11.5 , in the of 25 %, was maintained in 11.5 and the day 9 fell to 11 units, these values could inactivate the microorganisms<sup>(2)</sup>, stabilizing the sludge<sup>(1)</sup>. In the determination of coliform fecal and helminth eggs are obtained a high value for samples without treatment according to the NOM-004-SEMARNAT-2002, compared with treated samples due to alkalization of the medium being unfavourable to its development<sup>(2, 3)</sup>. It

was determined a decrease of moisture in samples treated mainly in the higher concentration (table 1), thereby influencing in the reduction of microorganisms<sup>(2)</sup>, coupled with the decrease of its unpleasant smell.

**Table 1.** Values obtained before and after the alkaline stabilization of the sludge.

Measured Variable	Initial Test	Final Test
Humidity (%)	4.23 %	Shows 100% Ca(OH) <sub>2</sub> : 0.06
		Shows 50% Ca(OH) <sub>2</sub> : 0.08
		Shows 25% Ca(OH) <sub>2</sub> : 0.43
Coliforms Fecal (Index of the MPN per 100 cm3)	≤ 2400	< 3
Helminth Eggs (H/ 2g ST)	Without sodium hypochlorite : 18	<1
	With sodium hypochlorite : 12	

H/ 2g ST: number of eggs/2 g of total solids

**Conclusions.** Due to the decrease in the number of coliform and fecal helminth eggs and the increase in the pH during the alkaline stabilization were obtained of sludge biosolids type A suitable for direct use in soils in the NOM-004-SEMARNAT-2002.

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