



Neutralizing TNT Acidic Wastewater with Neem Leaves Powder

Khalid Hamid Awadelseed^{1*} and Abdelmoneim Massad Abdalla²

¹Postgraduate College, Karary University, Chemical Department, Sudan

²Advanced Chemical Industrial Complex-Central Lab, Sudan

*Corresponding Author: Khalid Hamid Awadelseed, Postgraduate College, Karary University, Chemical Department, Sudan.

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Hamid Awadelseed and Abdelmoneim Massad Abdalla.

Abstract

This study conducted to substituting of NaOH used as a neutralizing agent for acidic wastewater generated from manufacturing of TNT in factory of Sudanese Military industries by natural material such as Neem leaves powder. The requirement for pH values of wastewater to be disposed over 6. Four weights (5, 7.5, 10 and 12.5) g of dry Neem leaves powder prepared and added to four samples of acidic wastewater with volume of 100 ml for each samples, the pH values of wastewater measured after four periods (1, 2, 3 and 4) hr for each weight added. The results showed the pH values raised from 1.7 to 6.94 and no any residual salts observed. The Neem leaves powder is effective alternatives for sodium hydroxide to neutralizing acidic wastewater at TNT plant.

Keywords: Biotreatment; Neem; Acidic Wastewater; Explosive Factory

Introduction

Mainly Land treatment processes [1-3] commonly termed natural systems, combine physical, chemical, and biological treatment mechanisms. Neem tree (*Azadirachta indica*) belongs to family Meliaceae grows naturally in Asian countries, especially Indian sub-continent. Neem tree is known to have medicinal properties [4] since long. It has been reported earlier that, its different parts contained several medicinal, insecticidal and antibacterial properties [5-11]. Neem leaves are often used for cleaning turbid ground water which may be applied in rural [12-14]. Previously studies [15] used Moringa leaves to treat acidic wastewater with pH 1.7 Moringa leaves raised pH to 5.8 in three hours by adding (NaOH) pH reached 6. The aim of this research is to find a new method of treating an acidic wastewater by Neem leaves powder, because Neem leaves is natural alkaline product.

Material and Methods

Material

Two liters of acidic wastewater from factory of Sudanese Military industries with pH 1.7 have been obtained, 500 g of Neem leaves powder have been prepared. pH meter (arm filed).

Methods

The experiments have been carried out in factory of Sudanese Military industries chemistry laboratories, amounts of (5.0, 7.5, 10 and 12.5) g for leaves powder. Neem leaves powder have been added to conical flasks and then filled with a 100 ml of acidic wastewater. Four testes at (1, 2, 3 and 4) hr have been carried out at 35°C by pH meter.

Results and Discussions

Table 1 is obtained which illustrated the effect of Neem leaves powder in the treatment process. Figure (1) is drawn for more illustration.

Four readings were obtained for different weights. The test result demonstrated that there was an increase from (1–4) hr in pH values until it reached 6.94, so that 4 hr was a suitable time to obtain a high value of pH in different weights. No salt settled in tank of treatment. Finally Neem seeds can be used in medicinal industries it is ecofriendly and proves to be the cheapest method of an acidic wastewater treatment. Neem leaves can be used in the explosive factories to treat acidic wastewater where no other facilities are available for acidic wastewater treatment. The results obtained evidenced that the leaves of Neem were a great alternative for use as an acidic wastewater treatment systems. Figure (1) shown the variation of pH value with Neem weight.

Weight (g)	pH after 1h	pH after 2h	pH after 3h	pH after 4h
5.0	6.45	6.64	6.83	6.85
7.5	6.58	6.88	6.89	6.94
10.0	6.80	6.85	6.90	6.92
12.5	6.84	6.88	6.90	6.94

Table 1: Effect of Neem in the treatment process.

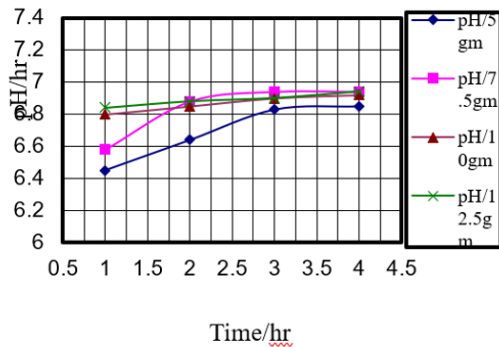


Figure 1: Variation of pH value with Neem weight.

Conclusions

Neem leaves powder acts as a natural alkaline product for the treatment of acidic wastewater. Thus it can be concluded that leaves powder of Neem was a reliable natural alkaline product.

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