

# REVIEW ON COMPARATIVE ANALYSIS OF NATURAL & CHEMICAL COAGULANTS

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**Abstract:** - Wholesome water needs to be treated in order to remove impurities & pathogenic microorganism to meet the quality guidelines for drinking water requirement according to World Health Organization. The use of locally available natural coagulants is used in this study to reduce turbidity of synthetic water. Using locally available natural coagulants are suitable, easier, & environment friendly options for water treatment were observed. Natural coagulants worked better with high, turbid, water compare to medium, or low, turbid, water. Utilization of these coagulants represents important progress in sustainable environmental technology as they are renewable resources & their application is directly related to the improvement of quality of life for underdeveloped communities. The combination of Moringa & alum stock solutions at 50% each showed the overall best result with the resultant water fit for drinking. The result of the comparative test showed that alum with its residual & health implications can be successfully replaced, partially or wholly, with natural coagulants.

**Keywords:** Moringa Oleifera, Okra, Coagulants, Alum, Jar Test

## 1. Application of Plant Based Coagulants For Waste Water Treatment 2011

G. Vijayaraghavan, T. Sivakumar, A. Vimal KumarIn.

This review paper of plant-based coagulant processes, effectiveness & relevant coagulating mechanisms for treatment of water & wastewater is presented. These coagulants are, in general, used as point-of-use technology in less-developed communities since they are relatively cost-effective compared to chemical coagulants, can be easily processed in usable form & biodegradable. These normal coagulants, when utilized for treatment of waters with low-to-medium turbidity are practically identical to their substance partners as far as treatment productivity. Their application for industrial wastewater treatment is still at their infancy. These natural coagulants function by means of adsorption mechanism followed by charge neutralization or polymeric bridging effect. Frequently studied plant-based coagulants include Moringa oleifera, Tannin & Cactus. Use of these coagulants speaks to significant advancement in economical ecological innovation as they are

sustainable assets & their application is legitimately identified with the improvement of personal satisfaction for immature networks.

## 2. Application of Moringa oleifera Plant as Water Purifier for Drinking Water Purposes 2017

Jessica Tunggolou & Carolyn Payus.

In this review paper we study drinking water needs to be treated in order to remove impurities & bacteria to meet the quality guidelines which satisfy nephelometric turbidity unit (NTU) for drinking water requirement according to World Health Organization. This venture is intended to analyze the treatment productivity of Moringa oleifera to that of aluminum sulfate, with respect to both treatment effectiveness & their consequences for water quality as far as turbidity expulsion. Approach. The study is conducted using Jar tests. Data obtained from the experiments are analyzed using microsoft excel office professional plus 2013.

## 3. Reduction of Turbidity of Water Using Locally Available Natural Coagulants

Md. Asrafuzzaman, A.N.M. Fakhruddin, & Md. Alamgir Hossain 2011.

In this review paper we understand that turbidity imparts a great problem in water treatment. Moringa oleifera, Cicer arietinum, & Dolichos lablab were used as locally available natural coagulants in this study to reduce turbidity of synthetic water. The tests were carried out, using artificial turbid water with conventional jar test apparatus. Optimum mixing intensity & duration were determined. After dosing water-soluble extracts of Moringa oleifera, Cicer arietinum, & Dolichos lablab reduced turbidity to 5.9, 3.9, & 11.1 nephelometric turbidity unit (NTU), respectively after dosing & filtration. Natural coagulants worked better with high, turbid, water compare to medium, or low, turbid, water. Highest turbidity reduction efficiency (95.89%) was found with Cicer arietinum. About 89 to 96% total coliform reduction were also found with natural coagulant treatment of turbid water. Utilizing locally accessible normal coagulants,

appropriate, simpler & condition agreeable alternatives for water treatment were watched.

#### 4. Comparative study of the use of natural & artificial coagulants for the treatment of sullage (domestic wastewater) 2017

**S.N. Ugwu, A.F. Umuokoro, E.A. Echiegu, B.O. Ugwuishiwi & C.C. Enweremadu**

This work presented a comparative study of the effectiveness of natural coagulant (Moringa oleifera & hydrolyzed cassava) extracts & artificial coagulant (alum) as primary coagulants for sullage from homes & cafeteria at the University of Nigeria, Nsukka. Stock solutions of these coagulants were prepared, & jar test of their varying mixing ratios used to obtain optimum dosages of Moringa, alum & cassava respectively. The effects of these optimum dosages were tested against turbidity, pH, BOD, nutrients, hardness. All tested parameters were significantly sensitive to concentrations of used stock solutions. 100% Moringa seed extract resulted in all the treated parameters (except turbidity) being within tolerable limits. The stock solution of 100% Alum also showed all tested parameters (except pH) to be within the standards for drinking water. The combination of Moringa & alum stock solutions at showed the overall best result with the resultant water fit for drinking. The aftereffect of the relative test demonstrated that alum with its remaining & wellbeing suggestions can be effectively supplanted, somewhat or completely, with natural coagulants.

#### 5. Application of Natural Coagulants in Water Purification 2013

**MS. Renuka A. Binayke, PROF. M.V. Jadhav**

In this present study experiments were conducted in the lab to investigate the efficiency of stock solutions obtained from the herbs of Moringa Oleifera (Drum sticks), Okra gum, & the mucilage isolated from the dry flowers of C. Procera as flocculent for the treatment of turbid water samples containing synthetic turbidity caused by clay materials. Jar test experiments were carried out for high, low level & medium level of turbidity with the flocculent dosages. For Moringa Oleifera Okra & C. Procera. The results have been compared with the results of alum. The supernatant turbidities obtained from this phase of the study were > 5 NTU. In the next phase again jar tests results were obtained from adding nearly 50% optimum dose of the natural coagulant was kept as constant & dosage of alum was varied. The supernatant turbidities acquired from this investigation were about

equivalent to 5 NTU. (Guide line value recommended by WHO)

#### Conclusion

The comparative test showed that alum with its residual & health significance can be successfully replaced, partially or wholly, with natural coagulants & tests gives similar results. So we can replace chemical coagulants with natural coagulants because they are cost effective & environmentally sustainable.

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