International Journal of Advance Research in Science and Engineering
Vol. No.10, Issue No. 01, January 2021
www.ijarse.com
IJARSE
ISSN 2319 - 8354

Study of bio enzyme as cleaning agent

Shubham S. Shende[1], Sagar M. Gawande[2], Pranav Y. Mandowara[3]

[1,2,3]*Anantrao Pawar College of Engineering and Research*

Abstract - *Detergents is extensive cleaning agent for wide domestic and industrial applications, detergent waste water acts long-term slow effects to environment and health study is carried out for characterization and impact of detergent on environment followed by study over regular washing habits are considered. Enzyme based cleaning agent is produced, Biodegradability of detergent and enzyme based cleaning agent is further studied. Study stated Enzyme based cleaning has initially have initially high BOD and COD values but later stabilizes. This is a domestically made enzyme approach of the research is to build effective solution which can be adopted by everyone.*

***Key Words*:** Detergents, cleaning, Enzyme, domestic, BOD ,COD, adopted.

1. INTRODUCTION

Indian Detergent using tradition involves two categories i.e. Machine wash along hand wash Detergents, Powder Detergent is always used with bar-detergent in hand wash technique where as in machine segments liquid along Powder detergent is used. Among the growing techno habits, Yet Approximate 78% of the market involves of the manual hand wash technique thus it is real need to come up with technology to support even the non-mechanical washing equipment too thus. A beter technology shall support cause to better environment. Detergents are active, are am-phiphilic: i.e partially hydrophilic and hydrophobic. With this dual nature, helps oil and grease (hydrophobic compounds) mix with water, along air being hydrophilic so even detergents give foaming effect too. Detergent is surface active agent, Hard detergents involves Detergent contains linear alkyl benzene sulfonate., anionic detergent that when react with waters can be toxic.

1.1 Problem Statement

Most Synthetic detergents are good cleansers agents, those involves surfactant which easily wets fabric, emulsify oils, it is even soluble to keep dirt in suspension, Phosphates along some toxic constitutes are formed, which runoff after use that could harm environment, Characteristics of waste water are not complying with MPCB recommended standers. It is a keen need to find better Solution options considering boon to environment.

2. METHODOLOGY

The wastewater samples are collected from domestic uses from various after wash potential wastewater and then characterized for various parameters. Major pollution parameter of concern will be analyzed with the standard parameters for discharge. Culture based bio-enzyme is made with use of citrus fruits, Soap seed powder the aim is to produce an bio-enzyme, this bio-enzyme is partially replaced with detergent to find best results, which could be easily made at home easily. Bio Enzyme is made with the ratio of 10:3:1:0.5:20 Ratio of Water: Lemon waste: Jaggery: Soap-seed Powder: Air. Fermentation process is involved to makeup enzyme,

Container is used is setup for minimizing oxygen, Use of pinch of yeast can make up enzyme in 3 week ,if no yeast The Usually, it takes three months for the Bio Enzyme to be ready. But when yeast is available it takes 12 weeks to enzyme to develop.

2.1 Enzyme Preparation

Bio Enzyme with the ratio of 10:3:1:0.5:20 Ratio of Water: Lemon waste: Jaggery: Soap-seed Powder: Air. Fermentation process is involved to makeup enzyme, Container is used is setup for minimizing oxygen, Use of pinch of yeast can make up enzyme in 3 weeks, if no yeast The Usually, it takes three months for the Bio Enzyme to be ready. But when yeast is available it takes 12 weeks to enzyme to develop. Every day ones for First week, other weeks alternate day, the lid should be opened to release gases, should tighten the lid after opening. The setup shall be placed at normal room temperature, preferably in cold place, the setup should not be in contact with direct sunlight.

Fig -1: Enzyme Preparation

Fig -2: Enzyme after fermentation

International Journal of Advance Research in Science and Engineering
Vol. No.10, Issue No. 01, January 2021
www.ijarse.com
IJARSE
ISSN 2319 - 8354

3. Result discussion

Table -1: Height of foam in Distilled water

Detergent	Height of foam in water (cm)
Nirma	2.3
Rin	2.4
Tide	2.2
Enzyme	1.3

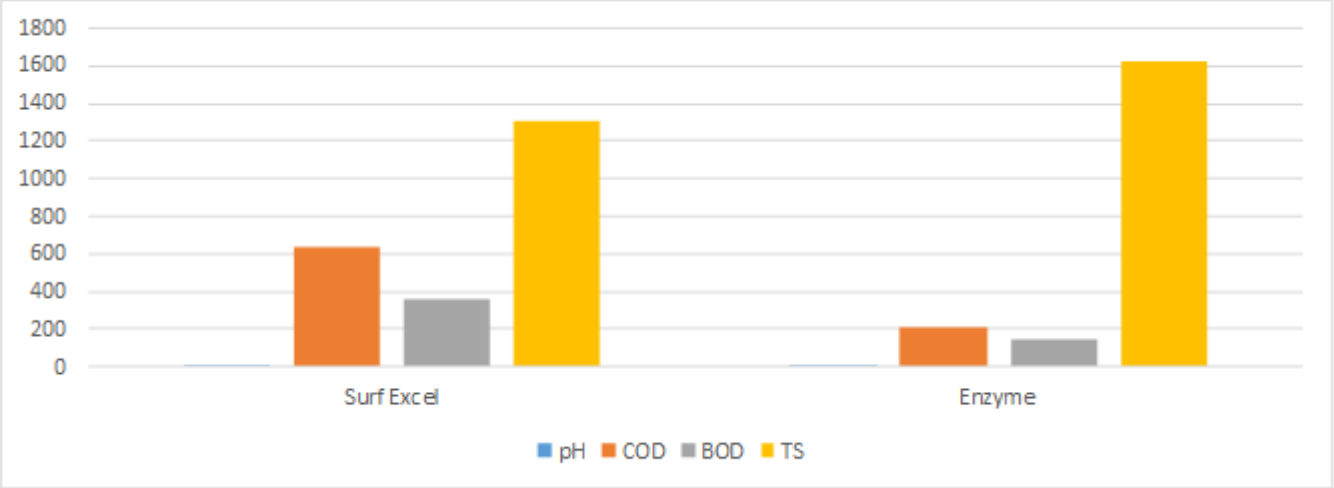

Chart -1: Front Loading

Font load devices have worked on mechanical equipment which are designed sophistically who has best capability with use of less amount of detergent

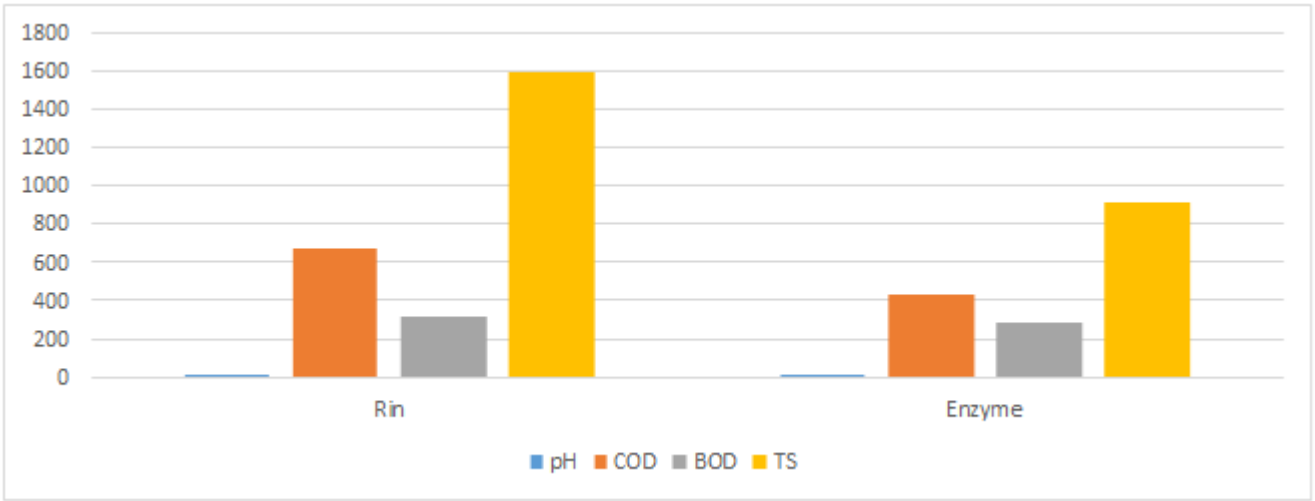

Chart -2: Top Loading

Cleaning ability is considerably less on aspect over enzyme wash, front load gave good potential to accept enzyme wash wherein in Top load equipment dint respond similar cleaning ability of tough stains. Enzyme can be used for regular wash els than with very heavy stains the clots to be soaked before wash

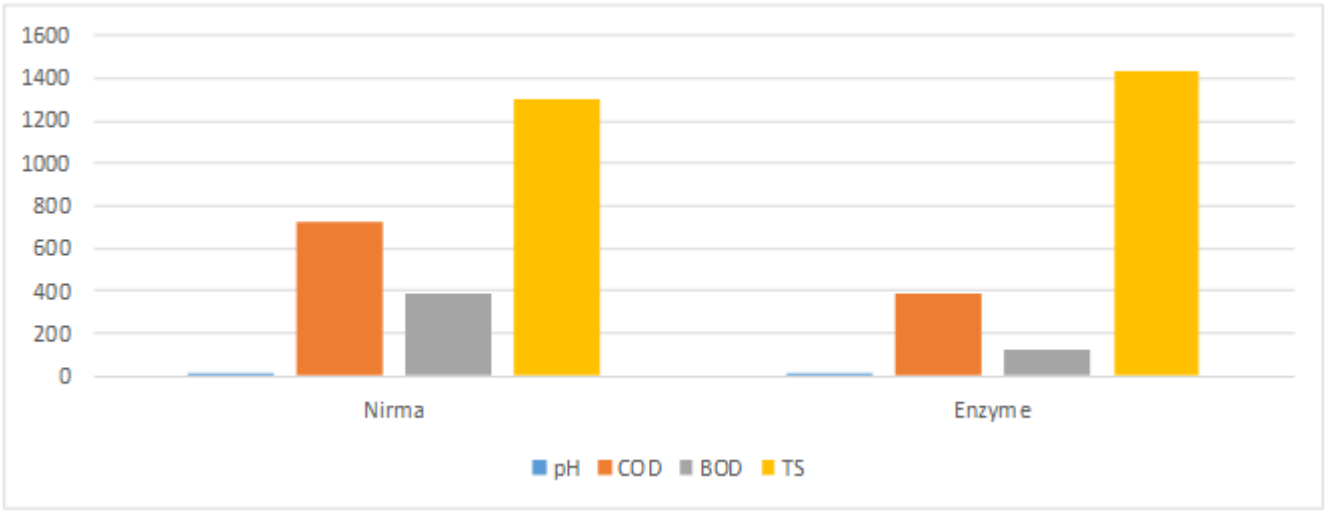

Chart -3: Manual Wash

Nirma is one of the most promising brand of detergent industry, as in manual hand wash the quantity of detergent is taken in regular course, more soaking time is required for best results, Color of Enzyme itself is not admissible with ecstatic, But it has good cleaning ability along biodegradable approach, which is further in Stabilization Ponds.

Stabilization Pond

With study of waste water on self-healing aspect, to check the biodegradability is the basic aim of stabilization pond. Practically waste water from detergent is diluted along mass water outflow thus, it has severer long-term effects.

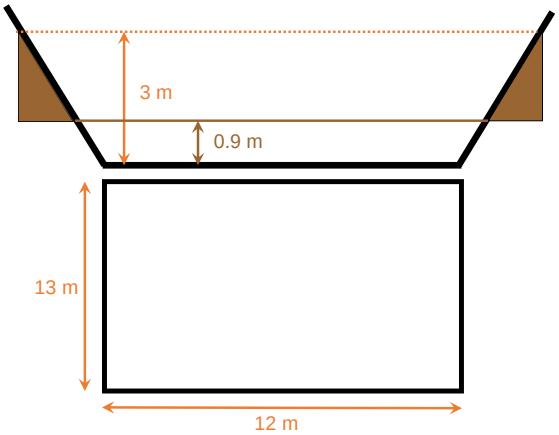

Fig -3: Stabilization pond

Table -1: Stabilization pond for front load detergent wash

Parameters	Day 1	Day 3	Day 5	Day 7
pH	8.1	7.8	7.8	7.8
COD	630	600	540	540
BOD	360	310	280	280

Detergent waste water stabilization pond for front load waste water acts biodegradable until 3rd day along, turned up stable were more internal decomposition activity stops.

Table -2: Stabilization pond for front load enzyme wash

Parameters	Day 1	Day 3	Day 5	Day 7
pH	7.8	7.2	7.2	7.2
COD	210	110	60	40
BOD	140	50	9	9.8

Detergent waste water stabilization pond for front load waste water acts biodegradable until 5th day along turned up stable were more internal decomposition activity stops, further detergent properties can't be balanced. Enzyme gives good self-biodegradable ability

Table -3: Stabilization pond for top load detergent wash

Parameters	**Day 1**	**Day 3**	**Day 5**	**Day 7**
pH	9.5	8.9	8.9	8.9
COD	670	590	410	420
BOD	320	220	190	190

Detergent waste water stabilization pond for top load waste water acts biodegradable until 3rd day along turned up slightly high on 7th day. Further Biodegradability is reduced

Table -4: Stabilization pond for top load enzyme wash

Parameters	**Day 1**	**Day 3**	**Day 5**	**Day 7**
pH	9.5	9	9	9
COD	430	290	190	50
BOD	280	120	69	11

Enzyme waste water stabilization pond for top load waste water acts biodegradability Continues 7th day along, further wastewater properties are balanced. Enzyme gives good self-biodegradable ability even waste water is later within MPCB Standards

Table -4: Stabilization pond for manual detergent wash

Parameters	Day 1	Day 3	Day 5	Day 7
pH	9.7	10	10	10
COD	720	425	400	390
BOD	390	300	220	190

Detergent waste water stabilization pond for manual hand wash waste water acts biodegradable until 5th day along turned up balanced Further Biodegradability is reduced

Table -4: Stabilization pond for manual enzyme wash

Parameters	Day 1	Day 3	Day 5	Day 7
pH	9.5	9.8	9.8	9.8
COD	390	192	97	58
BOD	130	60	10	6

Enzyme waste water stabilization pond for top load waste water acts biodegradability Continues 5th day along, further wastewater properties are balanced. Enzyme gives good self-biodegradable ability even waste water is later within MPCB Standards

3. CONCLUSIONS

Considering domestic cleaning agents the research comes with homemade biodegradable detergent. Soap-seed is important cleaning agent, it even gave better texture to the cloths. Even During the wash Enzyme gave up high COD and BOD ratings but further it had self-biodegrading capability which could be grate for domestic use. Stabilization Pond made up to define the biodegradability of the cleaning agent. The resources use to make enzyme is remotely available which can soot by everyone, even the raw material used may not be complete solid waste fresh lemon even gives best results. Making enzyme from waste and reusing it domestically is not easy to convince people, it is important to makeup people informed with the pros and cons of the enzyme cleaning agent.

REFERENCES

[1] Aberg CM, Chen T, Olumide A, Raghavan SR, Payne GF. Enzymatic grafting of peptides from casein hydrolysate to chitosan. Potential for value-added byproducts from foodprocessing wastes. J Agric Food Chem 2004; 52(4): 788-93.

[2] Alewo Opuada AMEH, Muhammed Tijani ISA and Ebenezer Konyeni UDOKA Biodegradable Detergents from Azadirachta Indica (neem) Seed Oil

[3] Sekhon, B.S., Sangha, M.K. Detergents — Zeolites and enzymes excel cleaning power. Reson 9, 35–45 (2004).

[4] Madhumithah CG, Krithiga R, Sundharam S, Changam SS, Guthakurta S protease by solid state fermentation by using Aspergillus niger. World J Agric Sci 7(5): 550-555.

[5] Arun, C. Sivashanmugam, P. 2017. Study on optimization of process parameters for enhancing the multihydrolytic enzyme activity in garbage enzyme produced from pre consumer organic waste. Bioresour Technol, 226: 200-210.

[6] MW, Lee, Bioaerosols from a food waste composting plant affect human airway epithelial cell remodeling. genesInt J Environ Res Public Health. 24;11(1): 337-54.

[7] Thirumurugan P (2016). Production and analysis of enzyme bio-cleaners from fruit and vegetable wastes by using yeast and bacteria. Student Project(D.O.Rc.No.1082/2015A; Project No: 28) submitted to Tamil Nadu State Council for Higher Education (TANSCHE), India pp: 4-6.

[8] Sarkar P, Meghvanshi M and Singh R (2011). Microbial consortinum: Approach in effective degradation of organic kitchen wastes. IJEST 2(3): 170-174.

[9] Balouiri M, Sadak M and Ibnsounda SK (2016). Methods for in vitro evaluating antimicrobial activity. J Pharm Anal 6: 71-79.

[10] Emimol A, Ganga G, Parvathy R, Radhika G and Nair GM (2012). Screening of microbes producing extracellular hydrolytic enzyme from corporation waste dumping site and house hold waste for the enhancement of bioremediation methods. IOSRJPBS 4(1): 54–60.

[11] Surender Singh, Methab Ali, Sapindus mukorossi: A review article, The Pharma Innovation Journal 2019; 8(12): 88-96