Environmental Impact Assessment of Tire Industry Effluent on Water & Soil Quality in Perambalur District

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***Abstract*:- Environmental Impact Assessment is an assessment of the possible impact positive or negative that a proposed project may have on the natural environment. Large quantities of those industrial particles are dispersed into the surroundings due to tire wear. Waste water effluents from the tire enterprise are considered the important resources, which pollute the surroundings. Innovative approaches for treating business wastewater containing heavy metals. Frequently contain technology for discount of toxicity with the intention to meet technology-based remedy requirements. To explore most adsorption efficiency in the direction of Removal of normally occurring heavy metals from waste water with the aid of using numerous adsorbents.**

1. INTRODUCTION

Uncontrolled burning of waste tires poses a critical public health and an environmental change. Since a large range of decomposition products may be given off from the out of control, open waste tire fires, its impact on soil, water and air is a major challenge.

Heavy metals are metallic, clearly going on compounds which have a totally excessive density as compared to other metals as minimum five instances the density of the water. To small doses could have severe effects they enter our bodies through food, drinking water and air.

Adsorption is a surface phenomenon, while absorption involves the agricultural residues can be used as adsorbent material in elimination of heavy metals as they're less high-priced, require little processing, without problems available and own right adsorption potential.

2. OBJECTIVES

Challenge is to deal with the water and soil from the tire industry surrounding region at Perambalur, Tamilnadu.

- To collect the polluted water and soil
- To characterize the physiochemical parameters
- To put together the standard values for heavy metal evaluation
- To use the agriculture waste for adsorption purpose
- Adsorption limit the concentration of the samples

3. METHODOLOGY

- Selection of industry
- Collection of soil and water
- Characterization of samples
- Assess the impacts of the industry
- Using Adsorption to remediate the impacts
- Result and discussion

4. RESULT & DISCUSSION

The sample preparation and preliminary experiment used to study the spectrum of Physiochemical and heavy metal by Atomic Absorption Spectroscopy. The data were obtained, further data is used for analysis. Each use may have its own quality requirement. The physical and chemical parameters such as pH, BOD, COD, cadmium, chromium, cupper, manganese, iron, zinc, nickel were analyzed and their results are discussed below.

Tab 1: Physiochemical parameters for soil & water.

Parameters	Soil	Water
pH	7.5–8.3	7.6–8.8
BOD	9.65–10.53	9.42–12.6
COD	17.62–19.33	18.7–19.74
Cd	0.39–0.78	1.94–2.89
Zn	2.19–3.98	5.06–6.18
Mn	0.19–0.36	0.23–0.3
Fe	0.36–0.48	0.31–0.48
Cu	0.56–0.66	0.27–0.81
Ni	0.12–0.65	0.23–0.49
Pb	0.11–0.19	0.12–0.21

4.1 PARAMETERS DISCUSSION

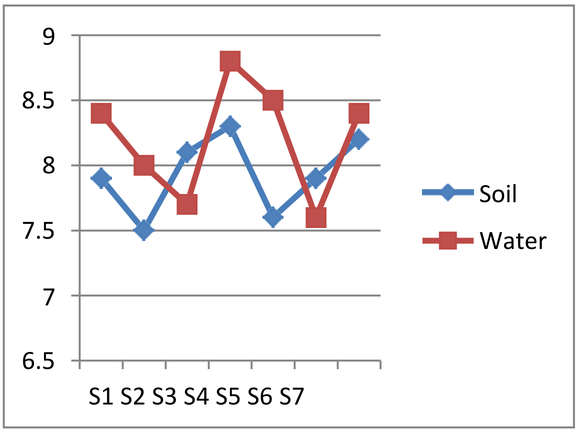

Fig 1: pH levels of the samples

The pH of soil is one of the most important physicochemical parameter. It affects mineral nutrient soil quality and much microorganism activity. The pH was observed in the ranges from 7.5 to 8.9. The water samples are more slightly alkaline and soil samples are medium alkaline.

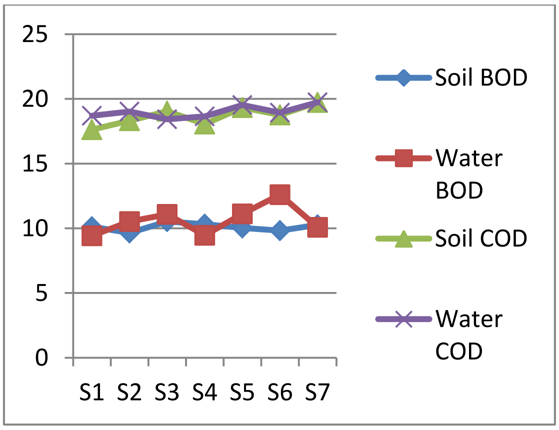

Fig 2:BOD&COD ranges of the samples

Both BOD and COD are key indicators of the environmental health of a surface water supply also commonly used in waste water treatment.

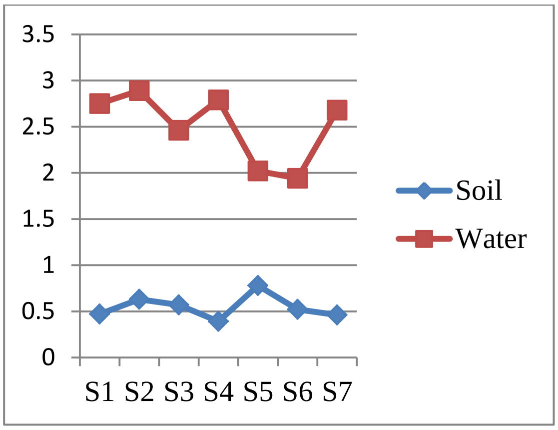

Fig 3: Cd concentration on polluted sample

This graph detailed the concentration of Cadmium is checked out by AAS apparatus. The both results were analyzed and the water is highly polluted by Cd heavy metal.

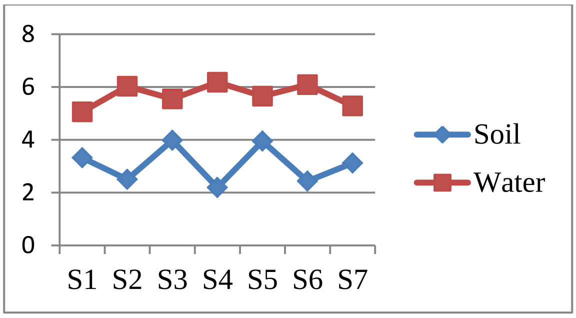

Fig 4: Zn concentration

Above graph shows the concentrations of Zinc in the samples were water has highly concentrated by this heavy metal.

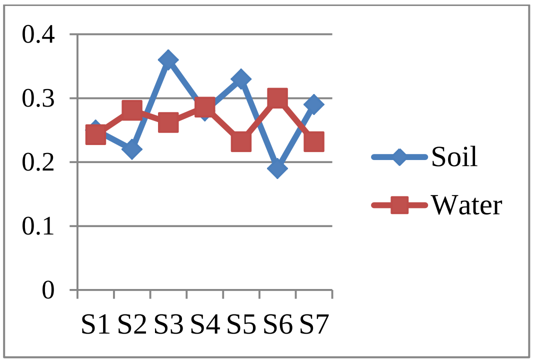

Fig 5: Mn concentration

According to this above picture explains the details of the Manganese in the tested samples were water has the highly polluted by industry effluent.

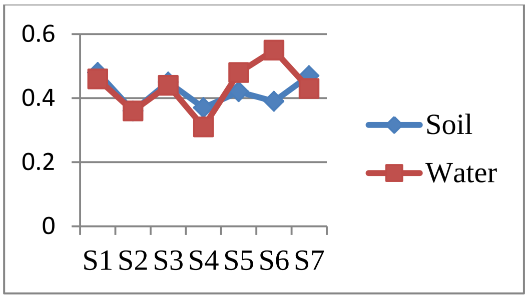

Fig 6: Fe concentration

The above graph shows that the concentration of Fe were the soil has high concentration.

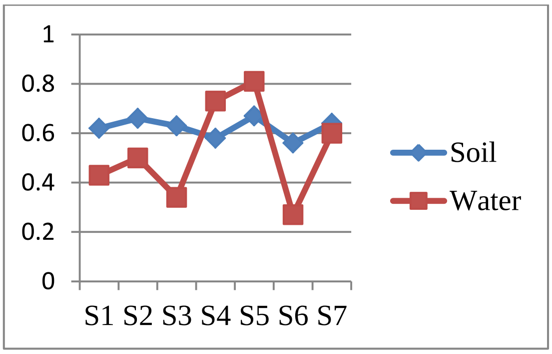

Fig 7: Cu concentration on polluted sample

The concentration of water is highly enrise by the Cu in the collected samples.

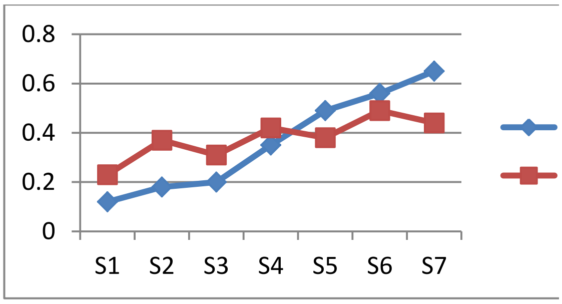

Fig 8: Ni concentration

Nickel, Ni is a transition element with atomic number 28 and molar mass 58.69 with four oxidation state +1, +2, +3 and +4.The above graph shows that the sample contamination of Ni.

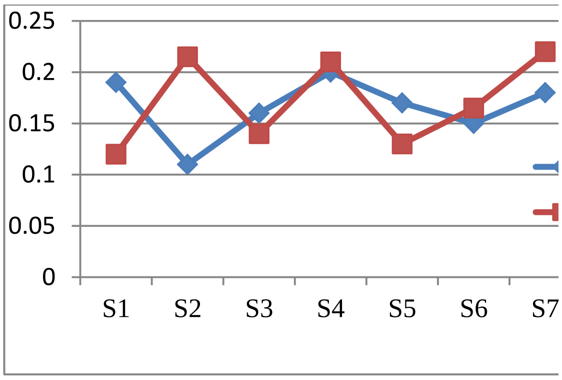

Fig 9: Pb concentration on polluted sample

Lead, Pb, is a metal with atomic number 82 and molar mass 207.2 with its ions exist in Pb2+. The above figure shows that the concentration of Pb occurred in the samples were water has high concentration Pb compare to soil samples.

4.2Adsorption process on minimizing heavy metals

The adsorption of the heavy metal ions by low cost adsorbents was evaluated under different conditions such as pH, heavy metal concentration and adsorbent dose through Kinetic and Isotherm studies. The optimum removal condition was identified for Cd, Pb and Zn and their adsorbents are Saw dust and Rice husk.

Tab 2: Removal efficiency for different absorbent dosage by using adsorbent

Heavy metal	Adsorbent dose	In heavy metals mg/l	Rice husk		Saw dust	
			Outlet	Removal ratio %	Outlet	Removal ratio %
Pb	20	0.21	0.19	22.06	0.203	20.35
	30	0.21	0.173	34.18	0.178	37.12
	40	0.21	0.151	48.05	0.15	49.21
	50	0.21	0.118	79.22	0.126	70.79
Cd	20	2.89	2.72	14.72	2.65	17.58
	30	2.89	2.53	29.19	2.47	33.81
	40	2.89	2.37	35.98	2.26	49.32
	50	2.89	2.01	58.04	1.82	60.95
Zn	20	6.18	6.03	21.36	5.73	30.65
	30	6.18	5.95	30.43	5.52	43.13
	40	6.18	5.74	52.83	5.38	58.74
	50	6.18	5.21	84.13	5.28	75.49

4.2.1Pb removal of various absorbent doses

The amount of adsorbent on the removal of Pb ions by adsorbent were dosed 20, 30, 40,50mg/l. While the Pb removal using saw dust ranged from 20.35% to 70.79%. Pb removal with rice husk rising from 22.06% to 79.22% with the increase of the amount of absorbent concentration.

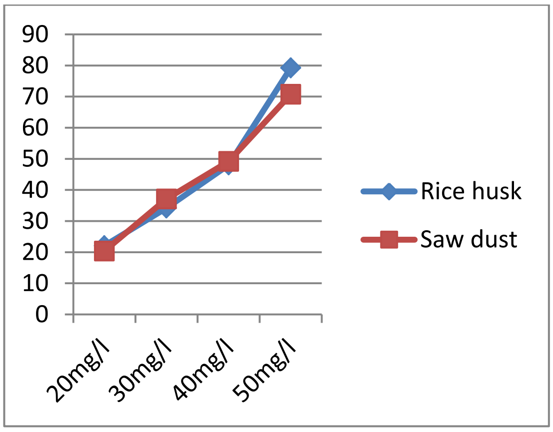

Fig 10: Comparison b/w rice husk and saw dust removal efficiency for Pb concentration.

4.2.2Cd removal of different absorbents

The effort of the amount of adsorbent on the removal of Cd ions Rice husk and Saw dust is same adsorbent doses. Their minimizing concentration by saw dust increased with 17.58% - 60.95% & Rice husk 14.72%-58.04% with the increased amount of absorbent concentrated.

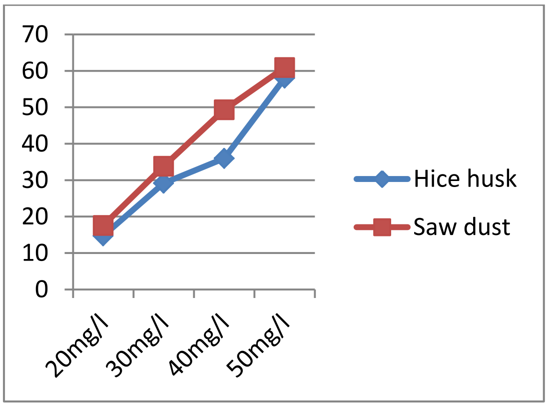

Fig 11: Cd removal efficiency by using Rice husk and Saw dust.

4.2.3Zn removal

The effort of adsorbent on the Zn removal of concentration can be reduced by rice husk and saw dust with different adsorbent doses like 20, 30, 40, 50mg/l. Zn removal by using Saw dust 30.65% - 75.49%, Rice husk varied from 21.36%- 84.13%.

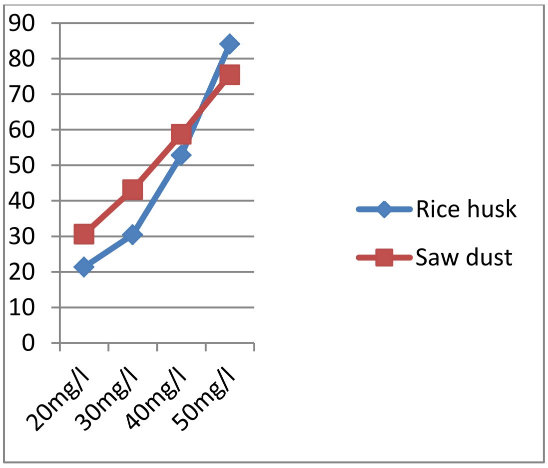

Fig 12:Comparison between rice husk and fly ash removal efficiency for Zn.

5.CONCLUSION

Many investigations have attempted out diverse adsorbents to remove heavy toxic metals from waste water successfully. The mixture of a physicochemical technique becomes determined to be very effective in getting rid of the pollution present in the tire industry. Thus its miles necessary to finish the treatment manner with a technique inclusive of AAS, to attain the Industrial effluent requirements, complementary procedures such as agriculture waste can be used. Also this results are indicates the agriculture adssssorbents for the removal of Cd, Cr, Cu from wastewater. It could be helpful for anybody to discover the satisfactory and the greenest adsorbent for the removal of a specific heavy metal present inside the effluent.

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