CHEMICAL CHARACTERISTICS OF INDUSTRIAL EFFLUENTS AFTER TREATMENT WITH BRICK PARTICLES

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Industrial development, hospital waste, household waste and uncontrolled agricultural practices have resulted in severe environment problems in Sri Lanka. Rivers, water streams and lakes have already been polluted with inorganic and organic pollutants, such as azo dyes and anthraquinone. This also contains pathogens (disease causing organisms), nutrients, such as nitrogen and phosphorus, solids, chemicals from cleaners and disinfectants and heavy metals. These pollutants can badly affect the humans, animals as well as aquatic lives. Some specific toxicity problems associated with heavy metals found in biological systems include formation of complexes with polysaccharides, bioaccumulation in tissues, and ability to combine or replace compounds witch perform important physiological functions. Therefore, contamination of water by ions has become a serious ongoing environmental problem.

Industrial effluents consist of the large amount of dyes, cations, anions and organic substances. These effluents should be properly treated before they are discharged into water bodies to protect human and the environment health. Current methods for such wastewater treatments include precipitation, coagulation/flotation, sedimentation, flotation, filtration, membrane process, electrochemical techniques, reverse osmosis, ion exchange, biological process, adsorption process and chemical reactions. Each method has its merits and demerits in application.

High cost of construction, operation and maintenance, and generation of large amount of unusable sludge have been a problem for effective treatment of industrial

effluents, especially in developing countries. Therefore methods used for treatment of wastewater especially industrial effluents, should be economical, effective and simple.

The aim of this research was to develop an inexpensive and an effective removal method for heavy metals and other anions using naturally occurring substances. The environment friendly substances in this regard introduce numerous advantages over conventional chemical methods. Brick was specially selected as it is a commonly available at a low cost. Bricks exhibit excellent removal ability to improve water quality parameters. This methodology was successfully extended for removal of ions present in industrial effluents collected from the water purification plant at Avissawella.

Experiments were carried out to check the water quality parameters in the lab made samples as well as the samples which were collected from water purification plant. (50 g of bricks were used for 1500 cm^3 of effluent.)

Physical parameters such as turbidity can be effectively reduced by using this treatment. Therefore bricks can be introduced as a good filter. Acidity, Conductivity, DO, and Solution pH are some chemical parameters, which can be controlled by bricks treatment. COD, which is one the most important parameters can be reduced very affectively.

In addition, concentration of cations such as cadmium, calcium, copper, magnesium, potassium, silver, sodium and zinc can also be minimized. Especially bricks, a low toxic substance, are good absorbent for heavy metals. Consequently, bricks can be applied to reduce the concentrations of anions as chlorides, nitrates, phosphates and sulfates. According to the respective measurements, significant reduction in the amounts of anions is observed after treating with bricks