Natural and waste materials using for wastewater treatment

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Abstract

A fundamental study was conducted to assess removal and filtration capacity of waste and natural indigenous materials as treatment mediums e.g., shell, limestone, waste paper mixed with refuse concrete, refuse cement, also processed nitrolite, charcoal-bio and charcoal. Under room temperature condition removal of phosphoric, nitric and ammonium-ions, filtration of suspended substance (SS) together with removal of COD in waste water was investigated. Influence of particle size effect for all treatment mediums except for waste paper was pursued. Significant improvement of waste water quality with respect to SS, phosphoric ions and decrease in COD is possible by treating with these filtration mediums. With specific reference to some treatment mediums NO_3–N and NH_4–N showed reasonable improvement in quality, although generally removal effect was not very significant. Efficacy of treatment was dependent on the particle size of treatment mediums in general, however, nitrolite for NH_4–N, charcoal-A for SS and COD, refuse cement mixed with waste paper for PO_4 ion removal showed insignificant variability on the particle size effect. Results of this fundamental study demonstrate effectiveness and feasibility for applied application of these proposed waste and naturally available treatment ingredients at lower cost.

Key words: waste treatment, removal, filtration, indigenous materials