

CORRELATION INVESTIGATION FOR DISSOLVED OXYGEN
AND DISSOLVED SULFUR
COMPOUNDS

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ABSTRACT

Accumulation of sulfur containing compounds and their bacterial mediated reduction, have lead the emission of pungent odors from polluted water bodies. This study is focused to investigate the contribution of inorganic sulfur compounds in the emission of hydrogen sulfide and to observe the possible correlations among inorganic sulfur species and correlations of each inorganic sulfur species to dissolved oxygen. The measured dissolved oxygen levels have demonstrated negative correlations with the dissolved sulfides implying that oxygen deficiency is the key for the reduction of other inorganic sulfur species, sulfates (SO_4^{2-}) and sulfites (SO_3^{2-}), to sulfide (S^{2-}) and these correlations were very significantly observed in highly polluted stagnant water bodies (eg. Lunawa Lagoon). However these correlations were not very significantly observed in relatively less polluted water bodies (eg. Maduganga). For the water bodies which show significant correlations, linear regressions are reported for them to be utilized in estimating one component of the regression from the measurement of the other. The measured data were further utilized to estimate the emission amount of hydrogen sulfide gas. The pH of the water bodies has confined much of the dissolved sulfide in the form of bisulfide ions and they can be easily escaped to the atmosphere upon acidification due to industrial discharge and/ or acid precipitations. The estimated emission level of hydrogen sulfide just above the surface of the water body was plotted for the most polluted water body, among all four water bodies under investigation, for the pH range of 5 – 10 and temperature range of 25 – 35 °C.