



Use of Hazardous Sludge Waste generated in the Common Effluent Treatment Plants as Fuels/Co-fuels - Viabilities with respect to total Organic Carbon, Calorific value and Ash content - an investigation

K. Sudhakar Babu^{1*}, B.V. Prasad², K.V. Ramani² and K. Hari Nagamaddaiah¹

1. Department of Chemistry, S.K.University, Anantapur, **INDIA**

2. Andhra Pradesh Pollution Control Board, Hyderabad, **INDIA**

Email: drksbabu9@gmail.com

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ABSTRACT

Three Common Effluent Treatment Plants (CETP) are in operation treating about 3,150 M³ day⁻¹ of toxic industrial effluents generated in various bulk drugs & pharmaceuticals, dye & dye intermediates and chemical industries located around the capital city of Hyderabad. These CETPs treat the effluents by employing equalisation / neutralisation, sedimentation, aerobic stabilisation process (activated sludge process) followed by sedimentation and sludge thickening. During the process of the treatment, an amount of about 2000 tons year⁻¹ of sludge waste (on dry basis) is generated, which is being disposed off in a secure landfill with proper treatment. These sludge wastes are considered as hazardous wastes as per the Indian regulatory "Hazardous Wastes (Management and Handling) Amendment Rules, 2000". The primary or inorganic sludge waste [generated during the primary clariflocculation or dissolved air floatation (DAF) process] and secondary or biological sludge (generated in the process of activated sludge process) samples have been collected separately, from the three CETPs. The dried sludge wastes are tested for total organic carbon (TOC), calorific value and ash content at 900^oC, for verifying the viability to use these sludge wastes as fuels or auxiliary fuels in incinerators, boilers or cement kilns. The calorific values of the sludge wastes are found to be directly proportional to the TOC values and indirectly proportional to the ash content. Calorific values of all except the primary sludge wastes of CETP-1 & 3 have a range between 2500 – 3000 K. Cal Kg⁻¹ and rated as equivalent to 'F' grade coal.

Keywords: CETPs, Sludge Waste, TOC, Calorific value, Ash content and Fuels.
