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Editorial

Preface: Special Issue on Innovative Processes and Technologies for the Management of Hazardous Waste

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1. Introduction

As economies grow in developing countries, waste generation rates are increasing steadily [1]. Understanding what the risks associated with managing the hazardous components of the waste are, and effectively implementing strategies to mitigate these risks are crucial. This is particularly so in developing countries where adequate access to resources, and relevant policies and skills are often limited [2–5]. For example, contamination of ground and surface waters, as well as soils in urban areas in developing countries with organic, inorganic, and microbial pollutants is a common and significant problem [6–10].

More stringent legislation and policies (e.g., [11]), and the need to reduce the impacts on the environment are increasingly driving the need to develop and employ innovative treatment technologies to effectively manage these hazardous waste [12–14].

This special issue provides case studies of how hazardous waste is being managed in a number of countries, and covering a range of innovative approaches including use of biochemical techniques, mathematical modelling, and use of unconventional technologies such as wet oxidation.

2. Highlights

Within recent decades, there has been significant socio-economic development, as well as population growth. These changes have brought with them increased resource consumption and the generation of increased levels of hazardous waste. Using the State of Gujarat as a best practice example, Karthikeyan et al. 2018 [15] examine how hazardous wastes are being managed in India.

Iyengar et al. 2018 [16] provide a bio-chemical perspective of how waste could be modified to reduce their hazard potential. Using green tea leaves as the bio-waste, specifically, the study examines the optimal chain length needed for tethering functional groups onto bio-wastes. The modification of the surface of the bio-waste serves as a means of improving the efficiency of removing phenols, which are acidic.

The study by Vaccari et al. 2018 [17] models the flow of a range of contaminants (As, Cd, Cu, Pb, Ni, and Zn) in dumpsites, and potential health risks as a means of enabling the more effective siting of facilities to reduce the risks posed. The study proposes a conservative model, using well consolidated equations and assumption, taking into account the path the pollutant makes to reach the water table and the point of exposure.

Hassan et al. 2018 [18] focus on assessing existing management of approaches for used needles in Khartoum, Sudan and proposing suitable recommendations for an improved and safer system for needle management.

Babalola 2018 [19] takes a technological approach to the management of the waste. The author uses a geographic-information-system-based multi-criteria decision analysis (GIS-MCDA) system to evaluate and examine the suitability of the study area in order to propose a suitable site for an anaerobic digestion facility in Oita City, Japan.

Similarly, Collivignarelli et al. 2018 [20] also employs a technological approach. This experimental study assesses the feasibility of using a wet oxidation process for treating fine soil with a high level of total petroleum hydrocarbons.

Conflicts of Interest: The authors declare no conflict of interest.

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