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### State of the Art Review on Landfill and Leachates Treatment in China

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<b>Abstract</b>	The main objectives of this study were to describe the municipal solid waste management, leachate characteristics of China landfills, and to summarize the present research of leachate treatments in china such as biological treatment, physical and chemical treatment and land treatment. In the survey of leachate from landfill in Chinese megapolis, the quality is characterized by chemical oxygen demand (COD) of 1500-80000 mg/L, biochemical oxygen demand (BOD) of 200-35000 mg/L, ammonia nitrogen (NH3-N) of 50-2400 mg/L, total nitrogen of 80-2600 mg/L, suspended solid of 30-7000 mg/L and pH value of 5-7.8. In engineering practices of China, the biological systems are usually adopted. Meanwhile, as far as the special quality of leachate is concerned, some chemical treatments are used as the pre-treatment or post-treatment to promote the effluent or improve the biological degradability of leachate.
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## State of the Art Review on Landfill and Leachates Treatment in China

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**Keywords:** Landfill management; Leachate treatment; China; MSW; Case studies

**Abstract.** The main objectives of this study were to describe the municipal solid waste management, leachate characteristics of China landfills, and to summarize the present research of leachate treatments in china such as biological treatment, physical and chemical treatment and land treatment. In the survey of leachate from landfill in Chinese megapolis, the quality is characterized by chemical oxygen demand (COD) of 1500-80000 mg/L, biochemical oxygen demand (BOD) of 200-35000 mg/L, ammonia nitrogen (NH<sub>3</sub>-N) of 50-2400 mg/L, total nitrogen of 80-2600 mg/L, suspended solid of 30-7000 mg/L and pH value of 5-7.8. In engineering practices of China, the biological systems are usually adopted. Meanwhile, as far as the special quality of leachate is concerned, some chemical treatments are used as the pre-treatment or post-treatment to promote the effluent or improve the biological degradability of leachate.

### Introduction

In the last decades, Chinese urban population increased rapidly as a result of the accelerated economic development and urbanization. At the same time, the estimated of the amount of municipal solid waste (MSW) has been growing year by year at the speed of 10 percentages approximately [1-3]. The rising quantity of MSW brings forward serious problem such as pollution of environment, threat to human health or safety, and hindrance to the sustainable development of the urban economy, and urgently needs resolution. There have lots of methods to treat MSW such as landfill, incineration, composting and so on. In metropolis of China, the most popular way is sanitary landfill. In recent years, there have about 600 sanitary landfills has been built, such as Ashuliwei landfill in Beijing, Tianzi ridge in Hangzhou, Laogang landfill in Shanghai. On the hand, lots of environmental problems can be solved by sanitary landfill, such as foul odor, fly and mosquito and so on, which is brought by open dump. On the other hand, several new environmental problems have to be paid attention to, for example, the leachate pollution. The leachates from landfills contain lots of pollutants, such as organic material, heavy metals, and the concentration varies greatly under different conditions. In this paper, the development in leachate treatment, the problems, and the future research direction will be expatiated upon.

### Solid waste management in China

**Amount of MSW in China.** With an urban population (including towns) around 360 million [4], China generates more than 1 billion tons of municipal solid wastes (MSW) per year [5]. The average increasing speed on the amount of MSW is from 8 to 10 percentages per year since 1988 in China. Especially, the population development in metropolis retains the high speed. For example, the increasing rate in Beijing is from 15 percentages to 20 percentages per year, and the amount of MSW will reach 6,570,000 tons in 2011 in Beijing[6]. The amount of municipal solid waste (MSW) generated and the collected per person per day has been growing year by year from 1999 to 2008 as shown in Fig. 1.

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