

Simplified Analytical Technology for Dioxins in Fly Ash Using Flame Ionization Detector Gas Chromatography

Abstract:

“High Clean DX” a dioxins removal technology for fly ash discharged from municipal solid waste (MSW) incinerators was developed. In the course of developing “High Clean DX,” a rapid analytical technology for the dioxins concentration in fly ash was important. A simplified analytical technology for dioxins in fly ash using flame ionization detector gas chromatography has been developed by focusing on the simple volatilization behavior of organic compounds.” This technology makes it possible to estimate the dioxins concentration of fly ash rapidly.

1. Introduction

The development of a simplified analytical technology for dioxins in fly ash is important for the rapid estimation of dioxins concentration in fly ash. In the course of developing “High Clean DX,” a rapid analytical technology for the dioxins concentration in fly ash was important. A simplified analytical technology for dioxins in fly ash using flame ionization detector gas chromatography has been developed by focusing on the simple volatilization behavior of organic compounds. This technology makes it possible to estimate the dioxins concentration of fly ash rapidly.

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2. Outline of “High Clean DX”

2.1 Process flow

The process flow of “High Clean DX” is shown in Fig. 1 and Fig. 2. The process flow is as follows: (1) Sample collection, (2) Sample preparation, (3) Analysis, and (4) Estimation of dioxins concentration.

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Technical Staff Member 1



Technical Staff Member 2

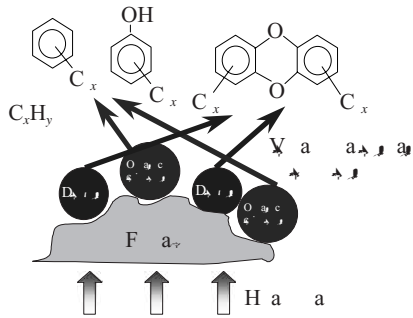


Fig.1 Principle of High Clean DX

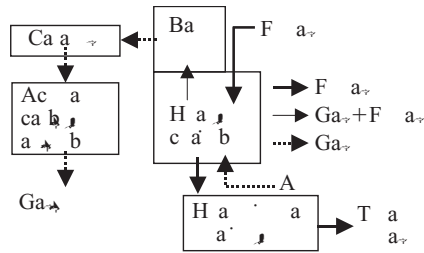
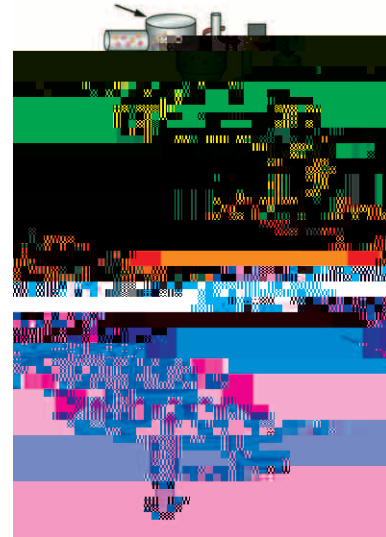


Fig.2 Flow chart of High Clean DX



The High Clean DX technology is a novel method for the treatment of fly ash. It involves the use of a fluidized bed reactor where the fly ash is heated and treated with a specific gas mixture. This process results in the conversion of the fly ash into a clean, usable product. The technology is based on the principle of high-temperature treatment and the use of a fluidized bed to ensure uniform heating and reaction.

2.2 Structure of Agitating Fluidized Bed Heating Chamber

The structure of the agitating fluidized bed heating chamber is designed to facilitate the uniform heating and treatment of the fly ash. It consists of a central heating chamber where the fly ash is placed, surrounded by a fluidized bed. The chamber is equipped with an agitator to ensure the fly ash is evenly distributed and heated. The entire system is controlled by a computerized system to maintain the desired temperature and reaction conditions.

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3. Volatilization of Organic Compounds from Fly Ash

3.1 Experimental Method:

The experimental method for the volatilization of organic compounds from fly ash involves the use of a fluidized bed reactor. The fly ash is placed in the reactor and heated to a high temperature. A specific gas mixture is introduced into the reactor, which causes the organic compounds to volatilize. The volatilized compounds are then collected and analyzed. The results of the experiment show that the High Clean DX technology is highly effective in the volatilization of organic compounds from fly ash.

