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Chlorobenzenes in Soil are Being Detected during In-Situ Bioremediation

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Abstract

Chlorobenzenes are hazardous organic compounds commonly found in soil due to industrial activities and improper waste disposal. In-situ bioremediation, a promising approach for soil cleanup, utilizes microorganisms to degrade or transform contaminants. However, the detection of chlorobenzenes during this process poses challenges. This abstract summarizes the issues associated with chlorobenzene detection during in-situ bioremediation and discusses potential strategies to address them. Challenges include low concentrations, matrix interference, and chemical transformations. Advanced analytical techniques such as GC-MS and HPLC coupled with mass spectrometry, along with optimized sample preparation techniques, can enhance detection sensitivity and accuracy. Molecular techniques like PCR and NGS provide insights into microbial communities involved in biodegradation. Regular monitoring and sampling frequency aid in evaluating the effectiveness of bioremediation. Overcoming these challenges will improve the assessment and success of in-situ bioremediation efforts targeting chlorobenzenes in soil.

Keywords: B ; I - ; C

Introduction

I - . I . 1 . C , .

Low concentrations: C , . C , .

Matrix interference: . , - - 2 . D .

Chemical transformations: D - , . A , .

Strategies for chlorobenzene detection: A : A (GC-) - (H C) .

Sample preparation: . - (E) - (E) . I .

Molecular techniques: , (C) - (G) 3 , .

Monitoring and sampling frequency: . F .

Method

Sample collection and preparation

. - (FE)- . C .

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. C

. I , ,

. A - , -

Extraction of Chlorobenzenes

(10-20)

. A , ,

. (., 30) .

. A , ( ) .

Cleaning of extracted sample

, - (E) .

. - E ,

. E E , .

Analytical detection

- (GC-) - (H C) .

. .

. I - .

. A , , , ,

. .

Quality control

I , , , ,

. , , .

Data analysis and interpretation

C .

. A - .

. C - .

Reporting: , , - , , 4, 5, 6 .

Results

- . , , . H :

Initial concentrations: B - , . .

Temporal changes: . I , , , .

Intermediate products: I , - - . - 7 .

End products: - , , .

Spatial variability: D , .

Compliance with standards: C - . I , .

Long-term monitoring: I , . - , , 8 .

Discussion