

# 活性汚泥における鉄, 硫黄, 窒素の酸化・還元細菌およびりん除去細菌の相互作用

著者	池本 良子
著者別表示	Ikemoto Ryoko
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# 1999 Fiscal Year Final Research Report Summary

Interactions among sulfur, iron and nitrogen oxidation-reduction bacteria, and poly-P accumulating bacteria in the activated sludge.

Research Project

## Project/Area Number

10650537

## Research Category

Grant-in-Aid for Scientific Research (C)

## Allocation Type

Single-year Grants

## Section

一般

## Research Field

Civil and environmental engineering

## Research Institution

Kanazawa University

## Principal Investigator

**IKEMOTO Ryoko** Kanazawa University, Dept. of Civil Engineering, Associate Prof., 工学部, 助教授 (40159223)

## Co-Investigator(Kenkyū-buntansha)

TANI Kinya Ishikawa Technical School, Dept. of Civil Engineering, Research Associate., 助手 (80290740)

KOMORI Tomoaki Kanazawa University, Dept. of Civil Engineering, Prof., 工学部, 教授 (50019725)

## Project Period (FY)

1998 - 1999

## Keywords

activated sludge / sulfate reduction / iron reduction / fulminates bulking / phosphate removal / denitrification / sulfur oxidation / coagulant

## Research Abstract


Interactions among sulfur, iron and nitrogen oxidation reduction bacteria, and poly-P accumulation bacteria in the activated sludge was examined to control bulking and nutrient removal. Sulfate reducing bacteria coexisted with sulfur oxidizing bacteria and produced ecological niche in the activated sludge flocs. They accelerated phosphate release in the anaerobic conditions due to produced acetate. Biological iron oxidation and reduction occurred in the activated sludge. Sulfur oxidizing bacteria competed oxygen with iron oxidizing bacteria in the aerobic conditions. In the anaerobic conditions, denitrification, sulfate reduction, iron reduction and phosphate release occurred simultaneously. They occurred according to thermodynamic advantage. Sulfate reducing bacteria competed hydrogen with iron reducing bacteria. Iron coagulant were


effective to improve filamentous bulking due to suppress sulfate reduction. They were also effective to suppress production of hydrogen sulfide and phosphate release in the wasted sludge during storage.

## Research Products (10 results)


All Other


All Publications


[Publications] R. Yamamoto-Ikemoto, S. Matsui, T. Komori and E. K. Bosque-Hamilton: "Interactions among filamentous sulfur bacteria, sulfate reducing bacteria and poly-P accumulation bacteria in the anaerobic-oxic activated sludge of a municipal plant"Water Sci. Tech.. Vol.37. 599-603 (1998) 


[Publications] R. Yamamoto-Ikemoto, S. Matsui, T. Komori and E. K. Bosque-Hamilton: "Control of filamentous bulking and interactions among sulfur oxidation-reduction and iron oxidation reduction in activated sludge using iron coagulant"Water Sci. Tech.. Vol.38. 9-17 (1998) 


[Publications] 池本良子: "水質保全のための下水道整備の効果と下水処理の高度化"金沢大学創立50周年記念シンポジウム講演論文集. 292-300 (1999) 


[Publications] Edja K. Bosque-Hamilton, R. Yamamoto-Ikemoto, T. Komori and T. Takekuma: "Simultaneous microbial sulfur and iron oxidation-reduction and phosphate release in anaerobic-oxic activated sludge"環境工学研究論文集. Vol.36. 145-154 (1999) 


[Publications] R. Yamamoto-Ikemoto, S. Matsui and T. Komori: "Effects of sulfur and iron concentrations on sulfur and iron oxidation-reduction"Water Quality International 2000. (発表予定). (2000) 

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[Publications] R. Yamamoto-Ikemoto: "Effects of sewerage system on water quality and development of effluent quality from sewerage treatment plant."Proceeding of the International Symposium Earth-Water-Humans. 262-300 (1999) 

[Publications] Edja K. Bosque-Hamilton, R. Yamamoto-Ikemoto: "Simultaneous microbial sulfur and iron oxidation-reduction and phosphate release in anaerobic-oxic activated sludge."Environmental Engineering Research. Vol. 36. 145-154 (1999) 

[Publications] R. Yamamoto-Ikemoto, S. Matsui and T. Komori: "Effects of sulfur and iron concentrations on sulfur and iron oxidation-reduction."Water Quality International 2000. (2000) 

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