

1992 Fiscal Year Final Research Report Summary

Analysis of Pollutants in Rain and Snow in the Circum-pan-Japan-Sea Area (Japan, Korea and China)

Research Project

Project/Area Number

02041032

Research Category

Grant-in-Aid for international Scientific Research

Allocation Type

Single-year Grants

Section

Field Research

Research Institution

Hokuriku University (1992)
Kanazawa University (1990-1991)

Principal Investigator

HIRAI Eiji Faculty of Pharmaceutical Sciences, Prof. Hokuriku Univ., 薬学部, 教授 (80019695)

Co-Investigator(Kenkyū-buntansha)

ISOMURA Kazuaki Kitakyushu National College of Technology, Prof., 教授 (80037887)
鍛治 利幸 北陸大学, 薬学部, 講師 (90204388)
YAMAGUCHI Kosuke Shimane Prefectural Institute of Public Health and Environmental Science, Head R, 主任研究員
KITAMURA Moritsugu Ishikawa Research Laboratory for Public Health And Environment, Head Researcher, 研究主幹
CHOHJI Tetsuji Toyama National College of Technology, Assoc. Prof., 助教授 (80092790)
MURAMOTO ken-ichiro Faculty of Technology, Assoc. Prof. Kanazawa Univ., 工学部, 助教授 (70042835)
UEKI Katsuji Faculty of Agriculture, Prof. Yamagata Univ., 農学部, 教授 (10111337)
HARA Hiroshi The Institute of Public Health, Head Researcher, 主任研究官
全 浩 国家環境保護局, 中日友好環境保護中心, 副総工程師
金 熙江 建国大学校工科大学, 教授
韓 義正 国立環境研究院, 大気化学担当官
李 敏熙 (社)環境同友会, 研究委員
MIYAZAKI Motoich Faculty of Pharmaceutical Sciences, Prof. Kanazawa Univ., 薬学部, 教授 (50009164)
HAO QUAN China National Environmental Monitoring Center, Vice Office Chief, China
EUI-JUNG HAN National Institute of Environmental Research, Head Researcher, Korea
HUI-KANG KIM College of Engineering, Prof. Kon-Kuku Univ. Korea
MIN-HEE LEE kyongju College, Assoc. Prof. Korea
KAJI Toshiyuki Faculty of Pharmaceutical Sciences, Asst. Prof. Hokuriku Univ.

Project Period (FY)

Keywords

rain, acid ; rain, snow / sulfuric ion / Kosa (yellow sand) / soil / atmospheric pressure arrangement / Japan-Sea rim / Chongqing / International Symposium on the Air Pollution Control Policy and Strategy Chongqing '92

Research Abstract

The concentration of sulfites was higher than that of nitrates in acid rain at China compared with that at Japan, North America and Europe. Eighty percent of the fossil fuel consumption was coal in China. The coal is rich in sulfur. The energy usage efficiency was low in China. Moreover, the Desulfur technic has not developed so much in China. Therefore, the acid rain in China was sulfuric type. The concentration of ammonium and calcium ion were high at Beijing and Tianjin compared with those at Chongqing and Guiyang, whereas, sulfuric ion concentration was similar between at these cities. Acidification of rain has not occurred in northern China yet, because ammonium and calcium ion neutralized acid rain. Generally, the soil in northern area is alkaline. When the airborne particulate matters were included in rain fall, the rain possibly be neutralized by airborne particulate matters, because the chemical characters of those are generally similar to that of soil. In other word, Kosa (yellow sand), which was generated from Kodo Plateau and Takuramakan Desert in northwest area of China, was one of the neutralizing material of acid rain.

International symposium was held at Chongqing in last year which was based on this study (International Symposium on the Air Pollution Control Policy and Strategy Chongqing '92, October, 1992, Chongqing, China). The proceedings were accompanied by this report. This abstract is also based on the research by Mr. Quan Hao, the member of our group in China, and Environmental Protection Bureau in Chongqing. In addition, Mr. Min-Hee Lee, the member of our group in Korea, obtained Ph Degree, by studying acid rain dynamics in Korea, at Kanazawa University on 12 th, March, 1992.

Research Products (90 results)

All Other

All Publications (90 results)

- [Publications] 平井 英二: "産業革命と地球サミット" 中日大気汚染防止対策シンポジウム-重慶'92講演要旨集. 5-12 (1992) ▼
- [Publications] 平井 英二: "重慶 シンポジウムの経過" 第4回国際学術研究公開シンポジウム 環日本海域における酸性雨・雪 講演要旨集. 9-10 (1993) ▼
- [Publications] Kazuichi Hayakawa: "Selective Peak Enhancement and Suppression in Conductometric Ion Chromatography and Its Application to the Determination of Trace Levels of Orthophosphate in Environmental Samples" Analytical Sciences. 8. 25-29 (1992) ▼
- [Publications] Kazuichi Hayakawa: "Effect of Removing Atmospheric Carbon Dioxide from Eluent in Determination of Trace Level Carbonate-Carbon by Ion Exclusion Chromatography" Analytical Sciences. 8. 111-113 (1992) ▼
- [Publications] Atsushi Yamamoto: "Retention Model of Multiple Eluent Ion Chromatography A Priori Estimations of Analyte Capacity Factor and Peak Intensity" Journal of Chromatography. 627. 17-22 (1992) ▼
- [Publications] Jun Kobayashi: "Synthesis of Salicylideneamino-2-thiophenol Immobilized Glass Beads and Their Application to a Preconcentration of Trace Aluminium(in press)" Chemical & Pharmaceutical Bulletin. 41. (1993) ▼
- [Publications] 宮崎 元一: "イオンクロマトグラフィー -吸光度検出法の活用- その1" 温泉科学. 42. 89-95 (1992) ▼
- [Publications] 宮崎 元一: "イオンクロマトグラフィーの公衆衛生関連領域への展開" 北陸公衆衛生学会誌. 19. 1-7 (1992) ▼
- [Publications] 宮崎 元一: "環境試料中の無機成分の分析法 -イオンクロマトグラフィーおよび原子吸光度法-" 中日大気汚染防洋対策シンポジウム-重慶'92 講行要旨集. 89-96 (1992) ▼
- [Publications] 李 敏熙: "酸性雨現象" 環境保全. 14. 35-54 (1992) ▼
- [Publications] 李 敏熙: "韓国環境大気中の粒子物質の動態" 第9回エアロゾル研究討論会・国際シンポジウム'92. 第2分冊. 71-81 (1992) ▼
- [Publications] 李 敏熙: "韓国における酸性雨の現状" 中日大気汚染防洋対策シンポジウム-重慶'92 講演要旨集. 29-36 (1992) ▼
- [Publications] 全 浩: "重慶大気汚染及其對生態的影響" 中日大気汚染防止対策シンポジウム-重慶'92 講演要旨集. 257-264 (1992) ▼

- [Publications] 全 浩: "酸性降水の来源及其氣象因素的關係" 中日大氣汚染防止対策シンポジウム-重慶'92 講演要旨集, 265-273 (1992) ▼
- [Publications] 全 浩: "廃棄物の回収利用及び再資源について" 第1回大学等廃棄物処理 アジア地域国際シンポジウム 講演要旨集, 15-24 (1992) ▼
- [Publications] 原 宏: "酸性雨とその測定法" ぶんせき, 612-620 (1992) ▼
- [Publications] 原 宏: "降水" 季刊 化学総説, 69-78 (1992) ▼
- [Publications] Hiroshi HARA: "Acid Deposition Chemistry in Japan" International Symposium on the Air Pollution Control Policy and Strategy chongqing '92, 43-52 (1992) ▼
- [Publications] 上木 勝司: "酸性降水物により湖沼や森林への生態的影響" 中日大氣汚染防止対策シンポジウム-重慶'92 講演要旨集, 53-62 (1992) ▼
- [Publications] Toshiaki TIDA: "Movement of Acidic Pollutants in the Snowpack during in situ Melting Process" Researches Related to the UNESCO's Man and the Biosphere Programme in Japan(1991 - 1992), 89-90 (1992) ▼
- [Publications] 保坂 良悦: "積雪に含まれる酸性降下物質(II)-山形大学上名川演習林の1990年積雪内カチオン濃度-" 東北の雪と生活, 7, 41-44 (1992) ▼
- [Publications] 塚原 初男: "積雪に含まれる酸性降下物質(V)-庄内空港～蔵王ラインの1991年積雪内イオン濃度-" 東北の雪と生活, 7, 55-60 (1992) ▼
- [Publications] 塚原 初男: "積雪に含まれる酸性降下物質(VI)-庄内空港～蔵王ラインの1992年積雪内イオン濃度-" 東北の雪と生活, 7, 61-66 (1992) ▼
- [Publications] 飯田 敏彰: "日本海沿岸地域における酸性雨・雪の特徴" 日本農業土木学会誌, 60, 1103-1106 (1992) ▼
- [Publications] Kenichiro MURAMOTO: "Measurement of Falling Motion of Snowflakes using CCD Camera" Proceedings of the NIPR Symposium on Polar Meteorology and Glaciology, 6, 71-76 (1992) ▼
- [Publications] 村本 健一郎: "気象観測と大気測定" 中日大氣汚染防止対策シンポジウム-重慶 '92 講演要旨集, 105-114 (1992) ▼
- [Publications] 丁子 哲治: "河川・湖沼水の酸性化と酸性降水の土壌による中和反応機構" 中日大氣汚染防止対策シンポジウム-重慶 '92 講演要旨集, 63-72 (1992) ▼
- [Publications] 丁子 哲治: "中国における建築材料や生態系などに及ぼす酸性降下物の影響" 第4回国際学術研究公開シンポジウム 環日本海域における酸性雨・雪 講演要旨集, 31-38 (1993) ▼
- [Publications] 丁子 哲治: "白山山頂における降水,池水,沢水中の無機イオン成分" 環境科学会誌, (1993) ▼
- [Publications] 中川 千枝: "酸性降水の土壌による中和反応機構に関する化学平衡論的解析" 水環境学会誌, 16, 114-121 (1993) ▼
- [Publications] 中川 千枝: "酸性降水の土壌による中和反応におけるCO₂の寄与" 水環境学会誌, 16, (1993) ▼
- [Publications] 北村 守次: "石川県における酸性雨調査(第6報) -硫黄安定同位体比からみた降水中硫酸イオンの起源の推定-" 石川県衛生公害研究所年報, 29, 97-106 (1992) ▼
- [Publications] 北村 守次: "酸性モニタリング地点の選定" 中日大氣汚染防止対策シンポジウム-重慶 '92 講演要旨集, 73-80 (1992) ▼
- [Publications] 柿澤 隆一: "石川県における降水成分調査結果(1991年度)" 石川県衛生公害研究所年報, 29, 230-245 (1992) ▼
- [Publications] 山岸 善久: "都市における大気中窒素酸化物の挙動" 石川県衛生公害研究所年報, 29, 246-255 (1992) ▼
- [Publications] Toshiyuki KAJI: "Effect of Cadmium on the Monolayer Maintenance of Vascular Endothelial Cells in Culture" Toxicology, 71, 267-276 (1992) ▼
- [Publications] Toshiyuki KAJI: "Inhibitory Effect of Lead on the Release of Tissue Plasminogen Activator form Human Vascular Endothelial Cells in culture" Toxicology, 73, 219-227 (1992) ▼
- [Publications] Toshiyuki KAJI: "Possible Mechanism for Zinc Protection against Cadmium Cytotoxicity in Cultured Vascular Endothelial Cells" Toxicology, 76, 257-270 (1992) ▼
- [Publications] Toshiyuki KAJI: "Zinc Protection against Cadmium-induced Destruction of the Momolayer of Cultured Vascular Endothelial Cells" Toxicology Letters, 66, 247-255 (1992) ▼

- [Publications] 山口 幸祐: "酸性雨調査における採取・分析方法" 中日大気汚染防止対策シンポジウム-重慶 '92 講演要旨集. 81-88 (1992) ▼
- [Publications] 山口 幸祐: "重慶及び中国における酸性降下物の動向" 第4回国際学術研究公開シンポジウム 環日本海域における酸性雨・雪 講演要旨集. 23-30 (1993) ▼
- [Publications] 磯村 計明: "石炭火力発電所における排ガス処理" 中日大気汚染防止対策シンポジウム-重慶'92 講演要旨集. 115-120 (1992) ▼
- [Publications] 平井 英二: "かていの勉強室 5 環境-その将来への対応" 新座市商工労政課, 30 (1992) ▼
- [Publications] 平井 英二: "国際学術研究 研究成果報告集No.4 環日本海域(日本・韓国および中国)における降雨・雪中の大気汚染物質の測定と解析" 国際学術研究平井班, 91 (1993) ▼
- [Publications] 秋元 肇,氷見 康二: "地球大気環境問題とその対造 -アジアからの視点-" オーム社, 340 (1993) ▼
- [Publications] Eiji Hirai: "The Industrial Revolution and the Earth Summit" International symposium on the Air Pollution Control Policy and Strategy Chongqing '92. 5-12 (1992) ▼
- [Publications] Eiji Hirai: "Process of "Symposium '92 in Chongqing"" The 4th International Symposium. Acid rain and Snow on the Japan-Sea Rim. 9-10 (1993) ▼
- [Publications] Kazuichi Hayakawa: "Selective Peak Enhancement and Suppression in Conductometric Ion Chromatography and Its Application to the Determination of Trace Levels of Orthophosphate in Environmental Samples" Analytical Sciences. 8. 25-29 (1992) ▼
- [Publications] Kazuichi Hayakawa: "Effect of Removing Atmospheric Carbon Dioxide from Eluent in Determination of Trace Level Carbonate-Carbon by Ion Exclusion Chromatography" Analytical Sciences. 8. 111-113 (1992) ▼
- [Publications] Atsushi Yamamoto: "Retention Model of Multiple Eluent Ion Chromatography A Priori Estimations of Analyte Capacity Factor and Peak Intensity" Journal of Chromatography. 627. 17-22 (1992) ▼
- [Publications] Jun Kobayashi: "Synthesis of Salicylideneamino-2-thiophenol Immobilized Glass Beads and Their Application to a Preconcentration of Trace Aluminium (in press)" Chemical & Pharmaceutical Bulletin. 41. 17-22 (1993) ▼
- [Publications] Motoichi Miyazaki: "Ion Chromatography -Application of Photometric Detection- Part 1 Introduction" Onsen Kagaku. 42. 89-95 (1992) ▼
- [Publications] Motoichi Miyazaki: "Contribution of Ion Chromatography Directed to the Field of Public Health" Hokuriku Journal of Public Health. 19. 1-7 (1992) ▼
- [Publications] Motoichi Miyazaki: "Analysis of Inorganic Constituents in Environmental Samples - Ion Chromatography and Atomic Absorption Spectrophotometry -" International Symposium on the Air Pollution Control Policy and Strategy Chongqing '92. 89-96 (1992) ▼
- [Publications] Min - Hee, Lee: "Present Status of Acid Precipitation in Korea" Bulletin of Korea Environmental Preservation Association. 14. 35-54 (1992) ▼
- [Publications] Min - Hee, Lee: "Behavior of Suspended Particulate Matter in Korea" The 9th Symposium on Aerosol Science and Technology in Conjunction with International Aerosol Seminar and Symposium Abstracts. Part II. 71-81 (1992) ▼
- [Publications] Min - Hee, Lee: "A Study on the Situation of Acid Rain in Korea" International Symposium on the Air Pollution Control Policy Chongqing 92 Abstracts. 29-36 (1992) ▼
- [Publications] Quan Hao: "Air Pollution and its Effects on Ecosystem in Chongqing" International Symposium on the Air Pollution Control Policy and Strategy Chongqing '92. 257-264 (1992) ▼
- [Publications] Quan Hao: "Sources and its Relationship with Meteorologic Factors of Acid Rain in China" International Symposium on the Air Pollution Control Policy and Strategy Chongqing '92. 265-273 (1992) ▼
- [Publications] Quan Hao: "Recovery and Recycling of Wastes" First International symposium of Wastes Treatment by Universities and Colleges at Asian Area. 15-24 (1992) ▼
- [Publications] Hiroshi Hara: "Acid Precipitation and its Measurements" Bunseki (Analysis). 612-620 (1992) ▼
- [Publications] Hiroshi Hara: "Precipitation" Kikan Kagaku Sosetsu (Quarterly Review of Chemistry). 69-78 (1992) ▼
- [Publications] Hiroshi Hara: "Acid Deposition Chemistry in Japan" International Symposium on the Air Pollution Control Policy and Strategy Chongqing '92. 43-52 (1992) ▼

- [Publications] Katsuji Ueki: "Ecological Effects of Acidic Precipitation on Lake and Forest" International Symposium on the Air Pollution Control Policy and Strategy Chongqing '92. 53-62 (1992) ▼
- [Publications] Toshiaki Iida: "Movement of Acidic Pollutants in the Snowpack during in situ Melting Process" Researches Related to the UNESCO's Man and the Biosphere Program in Japan (1991 -1992). 89-90 (1992) ▼
- [Publications] Ryoetsu Hosaka: "Acid Precipitates in Snow (II) - Major Cation Concentrations in the Snowpack on the Kaminagawa Experimental Forest of Yamagata University at 1990 -" Tohoku no Yuki to Seikatsu (Snow and Life in Tohoku). 7. 41-44 (1992) ▼
- [Publications] Hatsuo Tsukahara: "Acid Precipitates in Snow (V) - Major Ion Concentrations in the Snowpack along a Line from the Shonai Airport to Mt. Zao at 1991 -" Tohoku no Yuki to Seikatsu (Snow and Life in Tohoku). 7. 55-60 (1992) ▼
- [Publications] Hatsuo Tsukahara: "Acid Precipitates in Snow (VI) - Major Ion Concentrations in the Snowpack along a Line from Shnai Airport to Mt. Zao at 1992 -" Tohoku no Yuki to Seikatsu (Snow and Life in Tohoku). 7. 61-66 (1992) ▼
- [Publications] Ken'ichiro Muramoto: "Measurement of Falling Motion of Snowflakes using CCD Camera" Proceedings of the NIPR Symposium on Polar Meteorology and Glaciology. 6. 71-76 (1992) ▼
- [Publications] Ken-ichiro Muramoto: "An Outline of Weather Observation and Air Surveillances in Japan" International Symposium on the Air Pollution Control Policy and Strategy Chongqing '92. 105-114 (1992) ▼
- [Publications] TeTuji Chohji: "Acidification of Rivers and Lakes and Neutralization Mechanisms of Acidic Precipitation by Soil" International Symposium on the Air Pollution Control Policy and Strategy Chongqing '92. 63-72 (1992) ▼
- [Publications] Tetsuji Chohji: "Effects of Acidic Precipitation on Construction Materials. Ecosystems and Human Bodies in China" The 4th International Symposium Acid rain and Snow on the Japan-Sea Rim. 31-38 (1993) ▼
- [Publications] Tetsuji Chohji: "Inorganic components in Rain, Pond and Brook Water Collected at the Summit of the Mt. Hakusan" Environmental Science. (1993) ▼
- [Publications] Chie Nakagawa: "A Study of Neutralization Mechanisms of Acid Precipitation with Soils based on Chemical Equilibrium" Journal of Water Environment. 16. 114-121 (1993) ▼
- [Publications] Chie Nakagawa: "Contribution of Carbon Dioxide to Neutralization of Acid Precipitation with Soil" Journal of Water Environment. 16. (1993) ▼
- [Publications] Moritsugu Kitamura: "Survey of Acid Precipitation in Ishikawa Prefecture 6 An Estimation of the Origin of Sulfate Ion in Rain Water in View of Sulfur Isotopic Variations" Journal of Ishikawa Research Laboratory for Public Health and Environment. 29. 97-106 (1992) ▼
- [Publications] Moritsugu Kitamura: "How to Select Acid Precipitation Monitoring Points" International Symposium on the Air Pollution Control Policy and Strategy Chongqing '92. 73-80 (1992) ▼
- [Publications] Ryuichi Kakizawa: "Survey of Ionic Components in Rain Water in Ishikawa Prefecture from April 1991 to March 1992" Journal of ishikawa Research Laboratory for Public Health and Environment. 29. 230-245 (1992) ▼
- [Publications] Yoshihisa Yamagishi: "Survey Data of NOx in Atmosphere in Kanazawa" Journal of Ishikawa Research Laboratory for Public Health and Environment. 29. 246-255 (1992) ▼
- [Publications] Toshiyuki Kaji: "Effect of cadmium on the monolayer maintenance of vascular endothelial cells in culture" Toxicology. 71. 267-276 (1992) ▼
- [Publications] Toshiyuki Kaji: "Inhibitory effect of lead on the release of tissue plasminogen activator from human vascular endothelial cells in culture" Toxicology. 73. 219-227 (1992) ▼
- [Publications] Toshiyuki Kaji: "Possible mechanism for zinc protection against cadmium cytotoxicity in cultured vascular endothelial cells" Toxicology. 76. 257-270 (1992) ▼
- [Publications] Toshiyuki Kaji: "Zinc protection against cadmium-induced destruction of the monolayer of cultured vascular endothelial cells" Toxicol. Lett.66. 247-255 (1993) ▼
- [Publications] Kosuke Yamaguchi: "Sampling and Analytical Methods for Acidification in Japan" International Symposium on the Air Pollution Control Policy and Strategy Chongqing '92. 81-88 (1992) ▼
- [Publications] Kosuke Yamaguchi: "The Present Condition of Acid Deposition in Chouqing Area and in China" The 4th International Symposium. Acid Rain and Snow on the Japan-Sea Rim. 23-30 (1993) ▼

[Publications] Kazuaki isomura: "Treatment of Flue Gas from Coal - Fired Power Station" International Symposium on the Air Pollution Control Policy and Strategy Chongqing '92. 115-120 (1992) ▼

[Publications] Eiji Hirai: Department of Labor Policy for Commerce and Industry of Niiza City. Guide to Science for Ordinary People 5 Environment - Countermeasure for Future, (1992) ▼

[Publications] Eiji Hirai: Hirai Group of International Scientific Research Program. Analysis of Pollutants in Rain and Snow on the Japan-Sea Rim IV, 1 (1993) ▼

[Publications] Hajime Akimoto and Yasuji Himi: Ohm Co. Ltd.Environmental Problems of Global Atmosphere and it's Countermeasure, 151-215 (1992) ▼

[Publications] Toshiaki Iida: Japan Journal of Agricultural and Civil Engineering. Character of Acid Rain and Snow along on the Coast of the Japan-Sea, ▼

URL: https://kaken.nii.ac.jp/report/KAKENHI-PROJECT-02041032/020410321992kenkyu_seika_hokoku_

Published: 1994-03-23