

2007 Fiscal Year Final Research Report Summary

Interaction between polycyclic aromatic hydrocarbons (PAHs) and mineral grains with clarification of PAHs carrier in the atmosphere

Research Project

Project/Area Number

17340163

Research Category

Grant-in-Aid for Scientific Research (B)

Allocation Type

Single-year Grants

Section

一般

Research Field

Petrology/Mineralogy/Science of ore deposit

Research Institution

Hokkaido University (2006-2007)
Kanazawa University (2005)

Principal Investigator

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Project Period (FY)

2005 – 2007

Keywords

Asian dust (Kosa) / PAHs / Mineral / Pan-Japan Sea

Research Abstract

Long range transport of Polycyclic aromatic hydrocarbons (PAHs) with Asian dust was investigated by collecting Aerosol particles through a year from April 2003 at Kanazawa, Japan. PAHs content in Asian dust particles were highly variable in different Asian dust events. Developed kinetic model showed that sorption rate of less volatile PAHs than BaP on Asian dust particles are too low to be accumulated. The origin of those PAHs in Asian dust particles would be originally PAH-polluted soil

particles around industrialized area (e.g. loess regions around industrialized area). Back trajectory analyses also showed Asian dust with high less volatile PAHs content would have derived from loess area while Asian dust with undetectable amount of PAHs would have had source region in Mongolia and northern China. The stability of Pyr (a model PAHs) on different component of Asian dust particles was investigated under controlled temperature and relative humidity (RH) condition with/without light irradiation. Sialon and aluminol catalyze PAHs decomposition in the dark with enhanced catalytic effect by rinse in RH and light irradiation. Clay minerals protect Pyr against rise in RH and light irradiation to last several days. Most realistic carrier of PAHs is clay minerals. Geologic materials contribute atmospheric circulation of PAHs over long distance than previously thought.

Research Products (261 results)

	All	2008	2007	2006	2005
	All	Journal Article	Presentation	Book	
[Journal Article] Evaluation of Endocrine Disrupting Activities of Monohydroxylated Derivatives of 1-Nitropyrene by Yeast Two-hybrid Assay.					2008
[Journal Article] A Determination Method for Nitrocatecholamines in Rat Brain with High-Performance Liquid Chromatography-Peroxyoxalate Chemiluminescence Detection.					2008
[Journal Article] Long-Range Transportation of Polycyclic Aromatic Hydrocarbons from China to Japan.					2008
[Journal Article] Environmental quinoid polycyclic aromatic hydrocarbon, acenaththenequin one, modulates COX expression through ROS generation and NF-κB activation in A549 cells.					2008
[Journal Article] Evaluation of Endocrine Disrupting Activities of Monohydroxylated Derivatives of 1-Nitropyrene by Yeast Two-hybrid Assay.					2008
[Journal Article] Natural attenuation of antimony in mine drainage water.					2007
[Journal Article] Long-range transport of polycyclic aromatic hydrocarbons (PAHs) from the eastern Asian continent to Kanazawa, Japan with Asian dust Atmospheric Environment.					2007
[Journal Article] Uptake of dissolved arsenic in the retrieval of silica from spent geothermal brine.					2007
[Journal Article] モンモリロナイト/水分酸液の粘度に影響を与える要因					2007
[Journal Article] 高精製モンモリロナイトの調製とキャラクタリゼーション					2007
[Journal Article] Minireview: Biomarkers of exposure to polycyclic aromatic hydrocarbons and related compounds					2007
[Journal Article] Determination of Sequestering Agents on Cosmetics and Synthetic Detergents by High-Performance Liquid Chromatography with Ultraviolet Detection					2007
[Journal Article] 分析化学総説:有害性二ト多環芳香族炭化水素類を対象とする分析法の開発と環境動態解析					2007
[Journal Article] Simultaneous Chiral Resolution of Monosaccharides as 8-Aminonaphthalene-1,3,6-Trisulfonate Derivatives by Ligand-Exchange CE Using Borate as a Central Ion of the Chiral Selector					2007
[Journal Article] Identification of Estrogenic/Anti-Estrogenic Compounds in Diesel Exhaust Particulate Extract, Biomed.					2007
[Journal Article] Estrogenic/Antiestrogenic Activities of Polycyclic Aromatic Hydrocarbons and Their Monohydroxylated Derivatives by Yeast Two-Hybrid Assay					2007
[Journal Article] Analysis of 1-nitropyrene in air particulate matter standard reference materials by using two-dimensional high performance liquid chromatography with online reduction and tandem mass spectrometry detection					2007
[Journal Article] Enantioseparation of Isoxanthohumol in Beer by Hydroxypropyl-γ-cyclodextrin-Modified Micellar Electrokinetic Chromatography					2007
[Journal Article] Identification and Quantification of 1-Nitropyrene Metabolites in Human Urine as a Proposed Biomarker for Exposure to Diesel Exhaust					2007
[Journal Article] Degradation of Benzo [a] pyrene using TiO ₂ and Ag-loaded BiVO ₄ Photocatalysts: Evaluation by the Ames Mutagenicity Assay					2007
[Journal Article] Usefulness of Catechins and Caffeine Profiles to Determine Growing Areas of Green Tea Leaves of a Single Variety, Yabukita, in Japan					2007

[Journal Article] Determination of Low-Level Ethylenediaminetetraacetic Acid in Water Samples by Ion Chromatography with Ultraviolet Detection	2007	▼
[Journal Article] Atmospheric Environment in the Northeast Region of China in View of Polycyclic Aromatic Hydrocarbons and Nitropolycyclic Aromatic Hydrocarbons	2007	▼
[Journal Article] Study on atmospheric polycyclic aromatic hydrocarbons at a background site of Ishikawa prefecture. Japan.	2007	▼
[Journal Article] 多環芳香族炭化水素及び二ト口多環芳香族炭化水素から見た中国東北地方の大気環境.	2007	▼
[Journal Article] Deposition analysis of non sea-salt sulfate and nitrate along to the northwest winter monsoon in Hokuriku district by a snow boring core and bulk samples.	2007	▼
[Journal Article] Specific separation of polar analytes on a medium polar stationary phase by gas chromatography with carrier gas containing vaporous modifiers.	2007	▼
[Journal Article] Profiles of Particulate-Bound Polycyclic Aromatic Hydrocarbons and Their Nitrated Derivatives in Three Typical Cities, Liaoning Province, China.	2007	▼
[Journal Article] Rapid and sensitive determination of tryptophan, serotonin and psychoactive tryptamines by thin-layer chromatography/fluorescence detection.	2007	▼
[Journal Article] Bisphenol A (BPA) in foods in Japanese markets and its source.	2007	▼
[Journal Article] 経気道曝露化学物質とヒトの健康	2007	▼
[Journal Article] Development of analytical methods for polycyclic aromatic hydrocarbon compounds (PAHs) in airborne particulates: A review.	2007	▼
[Journal Article] Natural attenuation of antimony in mine drainage water.	2007	▼
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[Journal Article] Uptake of dissolved arsenic in the retrieval of silica from spent geothermal brine.	2007	▼
[Journal Article] The effective factors of montmorillonite/water system on viscosity	2007	▼
[Journal Article] Preparation and characterization for highly purified montmorillonite	2007	▼
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[Journal Article] Competitive Sorption of Pyrene on Wood Chars.	2006	▼
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[Journal Article] Mineralogical and geochemical constraints on arsenic mobility in a Philippine geothermal field.	2006	▼
[Journal Article] Estimation of Vertical Mixing Based on Water Current Monitoring in the Hypolimnion of Lake Biwa.	2006	▼
[Journal Article] Size distribution and anthropogenic sources apportionment of airborne trace metals in Kanazawa, Japan	2006	▼
[Journal Article] Uranium and thorium isotope distribution in an offshore bottom sediment core of the Selenga Delta, Lake Baikal, Siberia.	2006	▼
[Journal Article] Occurrence of polybrominated diphenyl ethers and polychlorinated biphenyls in shark liver oil supplements.	2006	▼
[Journal Article] Determination of 1-nitropyrene metabolites by HPLC with chemiluminescence detection and its application to human urine as a new biomarker of exposure to diesel exhaust.	2006	▼
[Journal Article] Chiral Capillary Electrophoresis of Amphetamine-Type Stimulants.	2006	▼
[Journal Article] Simultaneous determination of urinary hydroxylated metabolites of naphthalene, fluorine, phenanthrene, fluoranthene and pyrene as multiple biomarkers of exposure to polycyclic aromatic hydrocarbons.	2006	▼
[Journal Article] Development of Septum-Free Injector for Gas Chromatography and Its Application to The Sample with a High Boiling Point.	2006	▼
[Journal Article] Chiral Capillary Electrophoresis of Agrochemicals in Real Samples.	2006	▼
[Journal Article] Components of diesel exhaust particles differentially affect Th1/Th2 response in a murine model of allergic airway inflammation.	2006	▼
[Journal Article] A new On-line Sample Preparation System for the Liquid Chromatography/Time-of-Flight Mass Spectrometry Simultaneous Analysis of Pesticides in River Water.	2006	▼
[Journal Article] Atmospheric Deposition of Polychlorinated Dibenzo-p-dioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) in Kanazawa, Japan.	2006	▼
[Journal Article] Thymic involution produced by diesel exhaust particles and their constituents in mice.	2006	▼
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[Journal Article] 大気中の多環芳香族炭化水素類の計測法とその発生・動態解析研究の進歩	2006	▼
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[Journal Article] Source identification, size distribution and indicator screening of airborne trace metals in Kanazawa, Japan.	2005	▼
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[Journal Article] 黄砂と燃焼粉塵による東アジア地域の環境問題	2005	▼
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[Journal Article] Sorption and displacement of pyrene in soils and sediments.	2005	▼
[Journal Article] Environmental problems in eastern Asia by Kosa and combustion aerosol.	2005	▼
[Presentation] Hydro-environmental fluctuations around Lake Biwa during the past 2000 years	2008	▼
[Presentation] Long-range transport of polycyclic aromatic hydrocarbons (PAHs) from the eastern Asian continent to Kanazawa, Japan with Asian dust	2007	▼
[Presentation] The Environmental Carcinogen of Burning-driven Particulate Exhausts of Mutagenicity and Reactive Oxygen Species	2007	▼
[Presentation] The Environmental Carcinogen of Burning-driven Particulate Exhausts of Mutagenicity and Reactive Oxygen Species	2007	▼
[Presentation] Kinetics study on montmorillonite dissolution in high pH cement reaching solution	2007	▼
[Presentation] Long-range transport of polycyclic aromatic hydrocarbons (PAHs) from the eastern Asian continent to Kanazawa, Japan with Asian dust	2007	▼
[Presentation] Vertical Mixing of Lake Water and Sediment Transport Based on Four Year Continuous Monitoring in the Hypolimnion of Lake Biwa	2007	▼
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[Presentation] モンモリロナイト粒子のアスペクト比と水分散液の粘度との関係	2007	▼
[Presentation] 相対湿度制御下でのペプチド結合生成反応における鉱物の触媒作用	2007	▼
[Presentation] フミン酸をコーティングした鉱物へのフェナントレンの吸着とその後の安定性	2007	▼
[Presentation] アルカリ溶液の種類が及ぼすスメクタイトの溶解速度への影響	2007	▼
[Presentation] スメクタイト溶解のpH依存性に及ぼす温度の影響	2007	▼
[Presentation] 相対湿度制御下における鉱物粒子に伴われるPAHsの安定性	2007	▼
[Presentation] The relation between aspect ratio of montmorillonite and viscosity of motmorillonite/water system.	2007	▼
[Presentation] Catalytic activity of peptide formation of minerals under controlled relative humidity.	2007	▼
[Presentation] Adsorption of phenanthrene onto minerals coated with humic acid and their subsequent stability.	2007	▼
[Presentation] Difference of the dissolution rate of smectite with different kinds of alkaline solution.	2007	▼

[Presentation] The effect of temperature on the pH dependency of dissolution rate of smectite.	2007	▼
[Presentation] The stability of PAHs on mineral grains under controlled relative humidity.	2007	▼
[Presentation] Isomer Profile of PCDDs, PCDFs and Dioxin-Like PCBs in Sediment from Kahokugata Lagoon and Inflowng Rivers, Japan	2007	▼
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[Presentation] Long-Range Transport of Fluoride from China to Japan	2007	▼
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[Presentation] Late Cenozoic Hydro-Climatic Changes Inferred from Lake Baikal Sediment	2007	▼
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[Presentation] Oligomerization of amino acid on mineral surface under the pH controlled conditions	2007	▼
[Presentation] Stability of polycyclic aromatic hydrocarbons (PAHs) on mineral surfaces	2007	▼
[Presentation] Kinetics study of saponite dissolution under alkaline conditions	2007	▼
[Presentation] Combined effects of pH, temperature and deviation from equilibrium on dissolution rate of smectite under alkaline conditions	2007	▼
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[Presentation] 湖沼-流域系における地表過程と環境変動	2007	▼
[Presentation] Surface process and environmental changes in lake-watershed system	2007	▼
[Presentation] Kinetics study on montmorillonite dissolution in high pH cement reaching solution	2007	▼
[Presentation] Kinetics of smectite Dissolution under Alkaline Conditions and environmental mineralogy	2007	▼
[Presentation] Kinetics of smectite Dissolution under Alkaline Conditions and environmental mineralogy	2007	▼
[Presentation] Effect of deviation from equilibrium on dissolution rate of smectite under hyperalkaline condition	2007	▼
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[Presentation] Kinetics of smectite Dissolution under Alkaline Conditions, Institute of Earth Sciences	2007	▼
[Presentation] Mixture state of individual aerosols at the coastal area of the Japan Sea	2006	▼
[Presentation] Pilot Study on Exposure to Atmospheric Pyrene and 1-Nitropyrene during Driving in Shenyang, China	2006	▼
[Presentation] Long-range Transport of Polycyclic Aromatic Hydrocarbons from China to Japan	2006	▼
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[Presentation] Long-range Transport of Polycyclic Aromatic Hydrocarbons from China to Japan	2006	▼
[Presentation] Long-range transport of fluoride from China to Japan, The 2nd China-Japan-Korea	2006	▼

[Presentation] Long-range transport of fluoride from China to Japan, The 2nd China-Japan-Korea	2006	▼
[Presentation] 輪島で実証した冬季におけるアジア大陸からの大気中多環芳香族炭化水素類の長距離輸送	2006	▼
[Presentation] Long-range transport of PAHs from eastern Asia revealed at Wajima in winter	2006	▼
[Presentation] Atmospheric pollution by PAHs/nitro-PAHs over Pan-Japan area.	2006	▼
[Presentation] Existence of background dust in the free troposphere over an Asia dust source region	2006	▼
[Presentation] Long-range transport of polycyclic aromatic hydrocarbons and nitropolycyclic aromatic hydrocarbons from China to Japan	2006	▼
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[Presentation] 東アジアの都市における大気中多環芳香族化合物の環境動態	2006	▼
[Presentation] 輪島における多環芳香族炭化水素の実測値と化学物質輸送モデルを用いた他の大気汚染物質の計算値との相関比較	2006	▼
[Presentation] 長距離輸送初期段階における個々の黄砂粒子中の硫黄酸化物	2006	▼
[Presentation] アジア大陸から日本への多環芳香族炭化水素類の長距離輸送	2006	▼
[Presentation] Environmental dynamics of PAHs in the atmosphere over eastern Asian cities.	2006	▼
[Presentation] Comparison between measured PAHs concentration at Wajima and other pollutant concentrations calculated using chemical substances transport model.	2006	▼
[Presentation] Sulfuroxides in Kosa particles at the beginning of transportation.	2006	▼
[Presentation] Long-range transport of PAHs from Asian continent to Japan	2006	▼
[Presentation] ユーラシア東部・環日本海域における地表プロセスと湖沼-流域系情報	2006	▼
[Presentation] Surface process and lake-watershed informations in eastern Eurasia and Pan-Japan Sea areas	2006	▼
[Presentation] 輪島で観察された中国から日本へのPAHsの長距離輸送	2006	▼
[Presentation] 東アジアの都市大気中多環芳香族炭化水素類の動態	2006	▼
[Presentation] Long-range transport of PAHs form China to Japan observed at Wajima.	2006	▼
[Presentation] Dynamic behavior of PAHs in the atmosphere over eastern Asia.	2006	▼
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[Presentation] 環日本海域における多環芳香族炭化水素/ニトロ多環芳香族炭化水素の発生と大気環境問題	2006	▼
[Presentation] 東アジアの環境問題	2006	▼
[Presentation] Atmospheric environment in the Northeast region of China in view of polycyclic aromatic hydrocarbons and nitropolycyclic aromatic hydrocarbons	2006	▼
[Presentation] アルカリ環境におけるスメクタイトの溶解速度とバリア性能の長期評価	2006	▼
[Presentation] 鉱物とPAHsの相互作用	2006	▼

[Presentation] Dissolution rate of smectite in alkaline environment and assessments of barrier efficiency.	2006	▼
[Presentation] Interaction between PAHs and minerals.	2006	▼
[Presentation] Adsorption and Polymerization of Amino acid on Mineral Surface, 19th General Meeting of the International Mineralogical Association	2006	▼
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[Presentation] Seasonal Change of Lake Sediments with Climatic Changes in Lake Biwa	2005	▼
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