

# Program

## 4 October, 2008 (Sat.)

17:00-20:00     **Registration and display of posters at National Museum of Emerging Science and Innovation (Miraikan)**

18:00-21:00     **Icebreaker at Miraikan**

## 5 October, 2008 (Sun.)

9:00-9:30        Registration and display of posters

### Opening session

**Chairpersons: Naohiro Yoshida & Mark Thiemens**

9:30-9:50

1        Tracing material cycles with isotopomers in the Earth's history, global change, present environment, food analysis, and metabolic pathways  
Naohiro Yoshida

9:50-10:30

2        The mutual impact of atmospheric reactions experiments and chemical physics theory  
Rudolph A. Marcus

10:30-11:00     Coffee Break

### Evolution of the solar system and the Earth 1

**Chairpersons: Naohiro Yoshida & Mark Thiemens**

11:00-11:20

3        An Archean terrestrial fractionation line for oxygen isotopes  
Douglas Rumble, R. E. Blake, H. Bao, S. Bowring, T. Komiya., M. Rosing, and Y. Ueno

11:20-11:40

4        Thermochemical generation of anomalous (mass-independent) oxygen isotope distributions – is carbonate pyrolysis the only example?  
Martin Miller, J. M. Gibson, and J. K. Böhlke

11:40-12:00

5        First experimental test of self-shielding in VUV photodissociation of CO: Relevance for meteorite oxygen isotopes  
Subrata Chakraborty, Musahid Ahmed, Teresa L. Jackson, and Mark H. Thiemens

12:00-13:00     Lunch

### Evolution of the solar system and the Earth 2

**Chairpersons: Subrata Chakraborty & Martin Miller**

13:00-13:30

6        Chlorine isotope geochemistry  
Zachary Sharp and Jaime Barnes

13:30-13:50

7        Sulfur and oxygen mass-independent fractionation by SO<sub>2</sub> self-shielding, and incorporation of

S-MIF into Archean sediments  
James R. Lyons

13:50-14:10

- 8 High precision spectroscopy of  $^{32}\text{S}$ ,  $^{33}\text{S}$  and  $^{34}\text{S}$  sulfur dioxide: Ultraviolet absorption cross sections and fractionation constants  
Sebastian Danielache, Matthew S. Johnson, Shinkoh Nanbu, Mette M.L. Grage, Chris McLinden, and Naohiro Yoshida

14:10-14:30

- 9 Geological sulfur isotope distributions and MIF originated from  $\text{SO}_2$  photolysis  
Yuichiro Ueno, Matthew S Johnson, Sebastian O. Danielache, Carsten Eskebjerg, Antra Pandey, and Naohiro Yoshida

14:30-15:00 Coffee Break

### **Environmental observations 1: Multi isotope systematics**

**Chairpersons: Subrata Chakraborty & Martin Miller**

15:30-15:30

- 10 Oxygen isotopes ( $^{18}\text{O}$ ,  $^{17}\text{O}$  and  $^{16}\text{O}$ ) in the hydrologic cycle  
Boaz Luz

15:30-15:50

- 11 High-precision total sulfur isotope analysis ( $^{32}\text{S}$ - $^{33}\text{S}$ - $^{34}\text{S}$ - $^{36}\text{S}$ ) and its application to the studies of seafloor hydrothermal deposits and the deep biosphere  
Shuheji Ono, Douglas Rumble, Olivier Rouxel, Jeff Alt, and W. C. Pat Shanks

15:50-16:10

- 12 Biological fractionations of quadruple sulfur isotopes in a stratified lake  
Mayuko Nakagawa, Yuichiro Ueno, and Naohiro Yoshida

16:10-16:30

- 13 Reconstruction of Paleo-temperature using clumped isotopic signatures of the Phanerozoic soil carbonate from Satpura Gondwana succession central India  
Prosenjit Ghosh, Mikhail Vasiliev, Parthasarathi Ghosh, Soumen Sarkar, and Naohiro Yoshida

### **Poster session 1**

**Chairpersons: Yuichiro Ueno & Zachary Sharp**

16:30-18:00 Core time for P1-P20

## **6 October, 2008 (Mon.)**

### **Environmental observations 2: Nitrate**

**Chairpersons: Toshi Nagata & Vedula V.S.S. Sarma**

9:30-10:00

- 14 Insights on oceanic suboxic zone nitrogen cycling from dual isotopic measurements of nitrate and nitrite  
Karen L. Casciotti

10:00-10:30

- 15 Nitrogen and oxygen isotopic survey of nitrate in the polar environment  
Joël Savarino, Samuel Morin, and Markus Frey

10:30-11:00 Coffee Break

### **Environmental observations 2: Nitrate (continued)**

**Chairpersons: Toshi Nagata & Vedula V.S.S. Sarma**

11:00-11:20

- 16 Natural abundance N and O stable isotopes in nitrate: an undervalued tool for agro-ecological research  
Luc Rock and B. H. Ellert

11:20-11:40

- 17 Oxygen isotope signal of nitrate shows how high the gross nitrification was in the surface soils in a temperate forest in Japan  
Nobuhito Ohte, Ken'ichi Osaka, Ryunosuke Tateno, and Naoko Tokuchi

11:40-12:00 Symposium Photograph

12:00-13:00 Lunch

### **Environmental observations 3: Biogeochemical cycles**

**Chairpersons: Matthew S. Johnson & Keisuke Koba**

13:00-13:20

- 18 Adventures in an isotopically ordered world – the chemical ecology of Micronesian crabs and mangroves  
Brian Fry, Amanda W. J. Demopoulos, and Nicole Cormier

13:20-13:40

- 19 The isotopic composition of aerobic CH<sub>4</sub> production by organic matter under UV irradiation and heating  
Ivan Viganò, Thomas Röckmann, Rupert Holzinger, Arnold van Dijk, Frank Keppler, and Willi A. Brand

13:40-14:00

- 20 Isotopic constraints on the global budget and trend of atmospheric nitrous oxide  
Mao-Chang Liang and Yuk L. Yung

14:00-14:30 Coffee Break

### **Environmental observations 3: Biogeochemical cycles (continued)**

**Chairpersons: Matthew S. Johnson & Keisuke Koba**

14:30-14:50

- 21 Estimation of plankton metabolic rates in the western North Pacific using triple oxygen isotopes and O<sub>2</sub>/Ar ratios  
Vedula V.S.S. Sarma, O. Abe, and T. Saino

14:50-15:10

- 22 Integrated assessment of watershed environments by the use of multiple stable isotopes  
Toshi Nagata

15:10-15:30

- 23 Estimation of oxygen consumption in Lake Biwa using oxygen isotope ratio ( $\delta^{18}\text{O}$ ) of dissolved oxygen  
Ichiro Tayasu, Chikage Yoshimizu, Chulgoo Kim, Koh Maki, Yoko Nishimura, Naoshige Goto,

and Toshi Nagata

15:30-15:50

- 24 Size-Isotope distribution of raindrops  
Osamu Abe, Keiko Eguchi, Tetsuya Hiyama, and Stan Gedzelman

## **Poster session 2**

**Chairpersons: Osamu Abe & Reinhard Well**

15:50-17:20 Core time for P21-P31

18:30-20:30 **Banquet at the Hotel Nikko Tokyo**

## **7 October, 2008 (Tue.)**

### **Isotope fractionation estimated from theory and experimental simulation**

**Chairpersons: Robina Shaheen & Thomas Röckmann**

9:30-10:00

- 25 Mass independent sulfur isotopes in the early solar system, Mars, and the Pre-Cambrium Earth: Possible linkage to meteoritic oxygen isotopic anomalies  
Mark H. Thiemens

10:00-10:30

- 26 Anomalous enrichment of  $^{17}\text{O}$  and  $^{13}\text{C}$  due to hyperfine interaction in photodissociation of  $\text{CO}_2$   
Sasadhar Mahata and Sourendra K. Bhattacharya

10:30-11:00 Coffee Break

### **Isotope fractionation estimated from theory and experimental simulation (continued)**

**Chairpersons: Robina Shaheen & Thomas Röckmann**

11:00-11:20

- 27 Investigation of oxygen and nitrogen isotope fractionation in  $\text{N}_2\text{O}$  dissociation by electric discharge  
Antra Pandey, Sakae Toyoda, and Naohiro Yoshida

11:20-11:40

- 28 The complete photochemical mechanism for deuterium propagation through the atmospheric carbon cycle, experiment, theory and modeling  
Matthew S. Johnson, E. J. K. Nilsson, V. F. Andersen, S. Jørgensen, C. J. Nielsen, T. J. Wallington, S. Walter, and T. Röckmann

11:40-12:00

- 29 Ultraviolet absorption cross sections of isotopically substituted carbonyl sulfide species  
Shinkoh Nanbu, Sebastian O. Danielache, Matthew S. Johnson, and Naohiro Yoshida

12:00-12:20

- 30 Deuterium isotope effects in formaldehyde photolysis: Effects of pressure and wavelength  
Elna J. K. Nilsson, Sylvia Walter, Henrik Skov, Vibeke F. Andersena, Thomas Röckmann, and Matthew S. Johnson

12:20-13:20 Lunch

### **Environmental Observations 4: Trace gases**

**Chairpersons: Yasuko Kasai & Antra Pandey**

13:20-13:40

- 31 New information on the isotopic composition of H<sub>2</sub> from combustion and photochemical sources  
Thomas Röckmann, Sylvia Walter, Anneke Batenburg, Catalina Gomez Alvarez, Franz Rohrer, Robert Wegener, Holger Spahn, and Martin Vollmer

13:40-14:00

- 32 Chasing the pollutants: A new isotope tracer to identify long range transport and transformation of aerosol  
Robina Shaheen, A. Abramian, R. Sullivan, G. Dominguez, B. Bluen, T. Jackson, and M. H. Thiemens

14:00-14:20

- 33 Concentrations and isotopic characteristics of nitrous oxide in the eastern subtropical North Pacific Ocean  
Ayako Fujii, Osamu Yoshida, Narin Boontanon, Sakae Toyoda, Shuichi Watanabe, and Naohiro Yoshida

14:20-14:40

- 34 On the control of isotopologue signatures of soil-emitted N<sub>2</sub>O  
Reinhard Well and Heiner Flessa

14:40-15:00

- 35 Nitrogen cycling in Lake Kizaki elucidated by isotopic analysis  
Yuji Sasaki, Keisuke Koba, Muneoki Yoh, Akiko Makabe, Masamichi Yamamoto, Yuichiro Ueno, Mayuko Nakagawa, Sakae Toyoda, and Naohiro Yoshida

15:00-15:30 Coffee Break

### **Advances in measurements**

**Chairpersons: Yasuko Kasai & Antra Pandey**

15:30-15:50

- 36 Continuous and high-precision measurements of N<sub>2</sub>O and CO<sub>2</sub> isotopes with cryogen-free, quantum cascade laser based spectrometers  
Béla Tuzson, L. Emmenegger, J. Mohn, H. Wächter, and M. Zahniser

15:50-16:10

- 37 Selective detection of isotopomers with a quantum cascade laser II  
Naota Akikusa, T. Edamura, A. Sugiyama, T. Ochiai, K. Fujita, A. Ito, Y. Kaneko, M. Yamanishi, and H. Kan

16:10-16:30

- 38 Odin/SMR satellite observations of ozone and its isotopes in the middle atmosphere  
Yasuko Kasai, Joachim Urban, Donal Murtagh, and Odin/SMR retrieval team

### **Poster session 3**

**Chairpersons: Sakae Toyoda & Tae Siek Rhee**

16:30-18:00 Core time for P32-P49

**8 October, 2008 (Wed.)**

**Medical diagnosis and metabolic pathways 1**

**Chairpersons: Claude Guillou & Naohiko Ohkouchi**

9:30-10:00

39 Medical diagnosis of pediatrics (tentative)  
Virgilio Carnielli

10:00-10:30

40 Mammalian DNA intramolecular  $\delta^{15}\text{N}$  varies over a range of about 40‰  
M.S. Strable, C.L. Tschanz, B. Varamini, and J. Thomas Brenna

10:30-11:00 Coffee Break

**Medical diagnosis and metabolic pathways 2**

**Chairpersons: Claude Guillou & Naohiko Ohkouchi**

11:00-11:20

41 Multiple isotope forensics on nitrate in the 2007 poisoning of wild horses in southern Nevada  
Greg Michalski, Christa Dahman, Sam Earman, and Ron Hershey

11:20-11:40

42 Isotopomeric fractionation of four nitrogen isomers in chlorophyll a along reversed phase high performance liquid chromatography  
Yuichiro Kashiya, Y. Chikaraishi, N.O. Ogawa, and N. Ohkouchi

11:40-12:00

43 Recent advances in  $^{13}\text{C}$  isotopic analyses by LC-IRMS  
Jean-Philippe Godin

12:00-13:00 Lunch

**Poster session 4: Isotopomer synthesis, food authenticity and dietary analysis**

**Chairpersons: Keita Yamada & Andreas Hilkert**

13:00-14:00 Core time for P50-P57

13:30-14:00 Coffee Break

**Medical diagnosis and metabolic pathways 3**

**Chairpersons: J. Thomas Brenna & Greg Michalski**

14:00-14:20

44 Preliminary results on an interlaboratory comparison of site-specific isotope ratio in quantitative  $^{13}\text{C}$  NMR  
Virginie Silvestre, Nicolas Segebarth, Gérald S. Remaud, Claude Guillou, and Serge Akoka

14:20-14:40

45 Improvements in compound specific isotope analysis  
Andreas Hilkert, Dieter Juchelka, Michael Krummen, and Johannes B. Schwieters

14:40-15:00

46 Intramolecular carbon isotopic signature in tetrapyrrole nucleus of chlorophylls  
Naohiko Ohkouchi, Yoshito Chikaraishi, Yuichiro Kashiya, and Nanako O. Ogawa

15:00-15:20

47 Fractionation of hydrogen isotopes in lipid biosynthesis: hydrogenation and dehydrogenation  
Yoshito Chikaraishi, R. Tanaka, A. Tanaka, H. Kitazato, and N. Ohkouchi

15:20-15:50 Closing Remarks

## Poster Presentations

(All the posters can be displayed from 4 (evening) through 8 October.)

### Core time

**Poster session 1 (P1-P20): 5 October, 16:30-18:00**

**Poster session 2 (P21-P31): 6 October, 15:50-17:20**

**Poster session 3 (P32-P49): 7 October, 16:30-18:00**

**Poster session 4 (P50-P57): 8 October, 13:00-14:00**

- P1 Chemical reaction mechanism of oxygen-isotope in the Earth's upper atmosphere  
Takamasa Seta, Y. Hiraki, K. Seki, Y. Kasai, M. Ozima, and A. Yamada
- P2 *In-situ* Fe isotopic constraints on the evolution of Fe-cycle and redox state of the Archean shallow marine  
Manabu Nishizawa, Hiroki Yamamoto, and Takafumi Hirata
- P3 *In-situ* tracer experiments for deep-sea benthic Archaea: evidence of active metabolism by membrane lipid biomarkers  
Yoshinori Takano, Hidetaka Nomaki, Nanako O.Ogawa, Yoshito Chikaraishi, Hiroshi Kitazato, and Naohiko Ohkouchi
- P4 Seasonal variability of stable isotopes in precipitation over Thailand  
Kimpei Ichiyanaagi, Kei Yoshimura, Jun Matsumoto, and Manabu D. Yamanaka
- P5 <sup>17</sup>O-excess of water vapor in the Southern Ocean  
Ryu Uemura, Osamu Abe, Boaz Luz, and Eugeni Barkan
- P6 Estimation of allogenic and authigenic carbonates in sediments from Lake Hovsgol, Mongolia using multi isotopes  
Maki Morimoto, Osamu Abe, Keita Yamada, Naohiro Yoshida, and Prosenjit Ghosh
- P7 Clumped isotope analysis for paleothermometer on a delta-XP at Tokyo Tech.  
Mikhail Vasiliev, Prosenjit Ghosh, Keita Yamada, and Naohiro Yoshida
- P8 Analysis of seasonal variation of mass <sup>47</sup>-CO<sub>2</sub> in urban air  
Yota Kobayashi, Prosenjit Ghosh, Keita Yamada, Sakae Toyoda, Yuichiro Ueno, and Naohiro Yoshida
- P9 Measuring the variation of the isotopic composition of H<sub>2</sub> in the atmosphere  
Anneke M. Batenburg, T. Röckmann, and S.Walter
- P10 Modeling global H<sub>2</sub> and its stable isotope HD with the global TM5 model using a new condensed photochemical oxidation scheme for deuterated methane and VOC's  
G. Pieterse, M. Krol, and Thomas Röckmann
- P11 The isotopic composition of methane in the stratosphere  
Marc Brass and Thomas Röckmann

- P12 Hydrogen isotope effect of the photolysis of formaldehyde to the molecular and radical channels  
Tae Siek Rhee, Carl A. M. Brenninkmeijer, and Thomas Röckmann
- P13 Isotopic characterization of molecular hydrogen emitted from automobile exhaust  
Hiroki Shibata, Keita Yamada, Sakae Toyoda, and Naohiro Yoshida
- P14 Influence of long-term, whole-ecosystem experiments on methane dynamics in Arctic soils  
Nozomi Suzuki, Keisuke Koba, Yohei Matsui, Satoru Hobara, Gaius R. Shavers, Anne Giblin, Keita Yamada and Naohiro Yoshida
- P15 Temporal variations of CH<sub>4</sub> and its  $\delta^{13}\text{C}$  and  $\delta\text{D}$  at Ny-Ålesund, Svalbard  
Taku Umezawa, Shuji Aoki, Shinji Morimoto, Takakiyo Nakazawa, and Takashi Yamanouchi
- P16 Isotopic characterization of atmospheric methanol emitted from biomass burning and leaves  
Keita Yamada, Ryota Hattori, Yuji Ito, Hiroki Shibata, and Naohiro Yoshida
- P17 Isotopic characterization of atmospheric hydrogen emitted from biomass burning  
Keita Yamada, Mariko Hayashida, Hiroki Shibata, Sakae Toyoda, and Naohiro Yoshida
- P18 Stable carbon isotope ratios of airborne secondary particulate organic matter formed by photo-oxidation of toluene  
Satoshi Irei, Jochen Rudolph, Lin Huang, Janeen Auld, and Donald Hastie
- P19 Methane production and consumption in the Sea of Okhotsk based on carbon isotopic ratio  
Chiho Kubota, Osamu Yoshida, Kohei Kawano, Keita Yamada, Shuichi Watanabe, Masaaki Wakatsuchi, and Naohiro Yoshida
- P20 Distribution of Methane at WOCE-P01•P03 lines in the North Pacific  
Shou Imai, Osamu Yoshida, Kohei Kawano, Sakae Toyoda, Ayako Fujii, Keita Yamada, Shuichi Watanabe, and Naohiro Yoshida
- P21 Stable isotopic compositions of methane in Minami-Ensei and Iheya North hydrothermal fields, Okinawa Trough  
Kazuhiro Inoue, Yuichiro Ueno, Ken Takai, Satoshi Nakagawa, Takuro Nunoura, and Naohiro Yoshida
- P22 Source and reactivity of dissolved organic carbon in Lake Biwa: A stable isotopic approach  
Koh Maki, Chulgoo Kim, Chikage Yoshimizu, Ichiro Tayasu, and Toshi Nagata
- P23 <sup>15</sup>N enrichment during microbial decomposition of particulate organic matter: implications for <sup>15</sup>N systematics in a freshwater lake.  
Chikage Yoshimizu, Ichiro Tayasu, Chulgoo Kim, Koh Maki, Yoko Nishimura, and Toshi Nagata
- P24 Isotopic analysis of nitrate in the western equatorial Pacific  
Chisato Yoshikawa, Ayako Fujii, Akiko Makabe, Yoshifumi Tobari, Sakae Toyoda, and Naohiro Yoshida
- P25 Dynamics of nitrous oxide emitted from a sewage-polluted river in Mongolia  
Akiko Makabe, K. Koba, I. Tayasu, A. Kohzu, M. Itoh, C. Yoshimizu, N. O. Ogawa, N. Ohkouchi, S. Toyoda, N. Yoshida, and T. Nagata
- P26 Nitrogen dynamics in a sub-tropical forest in south China  
Keisuke Koba, Yurika Isogai, Muneoki Yoh, Jiangming Mo, Sakae Toyoda, and Naohiro Yoshida
- P27 Isotopomer analysis of N<sub>2</sub>O dynamics in the eastern North Pacific Ocean  
Tomohiro Miyafukuro, Sakae Toyoda, Osamu Yoshida, and Naohiro Yoshida

- P28 Isotopomeric analysis of N<sub>2</sub>O emitted from temperate agricultural soils  
Sakae Toyoda, Midori Yano, Sei-ichi Nishimura, Hiroko Akiyama, Atsushi Hayakawa, Keisuke Koba, Shigeto Sudo, Keita Yamada, Kazuyuki Yagi, Naohiro Yoshida, Nanako O. Ogawa, and Naohiko Ohkouchi
- P29 Estimate of nitrous oxide budget constrained from global nitrogen cycle  
Masao Sorai and Naohiro Yoshida
- P30 Three-dimensional model simulation of atmospheric nitrous oxide isotopes: comparison with balloon-observed profiles and estimation of the stratospheric effect on the surface  
Kentaro Ishijima, Sakae Toyoda, Masayuki Takigawa, Prabir K. Patra<sup>1</sup>, Takakiyo Nakazawa, Shuji Aoki, Shinji Morimoto, Chisato Yoshikawa, Satoru Arihara, and Naohiro Yoshida
- P31 Chemistry mechanism tagging in ECHAM5/MESSy/MECCA and its application to modeling of stable isotope composition of atmospheric constituents  
Sergey S. Gromov, P. Jöckel, R. Sander, and C. A. M. Brenninkmeijer
- P32 Stratospheric sulfur aerosols: Applying stable isotopes to readdress sources  
Sebastian Danielache, Naohiro Yoshida, Yuichiro Ueno, Carsten Eskebjerg, and Matthew S. Johnson
- P33 <sup>32</sup>S/<sup>33</sup>S/<sup>34</sup>S and <sup>36</sup>S kinetic fractionation effects in the reaction of OCS with OH radical  
Sebastian Danielache, Matthew S. Johnson, Shinkoh Nanbu, Mette M.L. Grage, Chris McLinden, and Naohiro Yoshida
- P34 Kinetic isotope effects in the OH and Cl reactions of methane and the chloro-methanes  
Elna J. K. Nilsson, Karen L. Feilberg, Stig R. Sellevåg, Matthew S. Johnson, and Claus J. Nielsen
- P35 A photochemical reactor for studies of atmospheric chemistry  
Elna J. K. Nilsson, Carsten Eskebjerg, and Matthew S. Johnson
- P36 Propagation of deuterium through the atmospheric carbon cycle studied using transition state theory  
Elna J. K. Nilsson, Solvejg Jørgensena, Allan Gross, and Matthew S. Johnson
- P37 Photodissociation Dynamics of HCl and DCl  
Johan A. Schmidt, Matthew S. Johnson, Mette Grage, and Gunnar Nyman
- P38 Photolysis of isotopic analogues of NO<sub>2</sub>  
Mette M-L Grage, Gunnar Nyman, Zhi-Gang Sun, Ole John Nielsen, and Matthew S. Johnson
- P39 Evaluation of mass-independent fractionation for ionic oxygen isotope in the terrestrial thermosphere  
Yasutaka Hiraki, Yasuko Kasai, Minoru Ozima, Kanako Seki, Takamasa Seta, and Akinori Yamada
- P40 Mass-independent fractionation of oxygen ion O<sup>+</sup> in thermosphere  
Akinori Yamada, Y. Hiraki, T. Seta, K. Seki, S. Nanbu, Y. Kasai, and M. Ozima
- P41 Spectroscopic measurement of the CH<sub>3</sub>D/CH<sub>4</sub> ratio using difference frequency generation with an efficient periodically poled lithium niobate waveguide  
Kiyoshi Tsuji, K. Takahata, H. Teshima, N. Yoshida, and H. Sasada
- P42 Real-time measurements of atmospheric CO<sub>2</sub> isotope ratios (<sup>13</sup>C, <sup>18</sup>O) using a mid-IR QC laser  
Julie K. Pearce, T. Nakayama, E. Iwasaki, Y. Matsumi, Y. Takahashi, T. Shibata, G. Inoue, and T. Hiyama
- P43 Mass dependent isotopic fractionation in ozone produced by electrolysis

Sourendra K. Bhattacharya, Joel Savarino, and Boaz Luz

- P44 A new method for  $\Delta^{17}\text{O}$  measurement in  $\text{N}_2\text{O}$   
Antra Pandey, Sakae Toyoda, and Naohiro Yoshida
- P45 New method of nitrate extraction for measurement of nitrogen and oxygen isotope ratio in food and environment samples  
Sorin Cosofret, Fabiano Reniero, and Claude Guillou
- P46 Short-term measurement of stable isotope fractionation in carbon assimilation and respiration by aquatic macrophytes  
Matheus Carvalho de Carvalho, Ken-Ichi Hayashizaki, and Hisao Ogawa
- P47 Comprehensive 2D gas chromatography combustion isotope ratio mass spectrometry (GCxGCC-IRMS)  
H.J. Tobias, G.L. Sacks, Y. Zhang, and J. Thomas Brenna
- P48 Determination of the  $^{15}\text{N}/^{14}\text{N}$ ,  $^{17}\text{O}/^{16}\text{O}$ , and  $^{18}\text{O}/^{16}\text{O}$  ratios of nitrous oxide by using continuous-flow isotope ratio mass spectrometry  
Daisuke D. Komatsu, Toyoho Ishimura, Fumiko Nakagawa, and Urumu Tsunogai
- P49 The oxygen isotopic character of nitrous oxide leaking from soil surface  
Motoki Sasakawa, Carina van der Veen, and Thomas Röckmann
- P50 Dietary reconstruction of Jomon hunter-gatherers by nitrogen isotopic composition of amino acids  
Yuichi Naito, Y. Chikaraishi, N. Ohkouchi, and M. Yoneda
- P51 Synthesis of 1,2,3,4,5,10- $^{13}\text{C}_6$ -estradiol, an estradiol isotopomer  
Yu Nagano, Rieko Tainakana, Kazuma Niizeki, Yusuke Shimizu, and Isao Shimizu
- P52 A study by carbon and nitrogen stable isotopes on the turn over time of hair and serum in Asiatic black bear  
Rumiko Nakashita, Yaeko Suzuki, Takashi Korenaga, Tsukasa Okano, Takeshi Komatsu, Hidetake Hayashi, Muneoki Yoh, and Toshio Tsubota
- P53 High sensitive detection of  $^{15}\text{N}$ -labeled amino acids in crops by GC/IRMS  
Mayu Yamamoto, Yaeko Suzuki, Rumiko Nakashita, Takahiro Ichimiya, Fumikazu Akamatsu, and Takashi Korenaga
- P54 Application of stable isotope analysis to verify the authenticity of beef  
Takahiro Ichimiya, Rumiko Nakashita, Yaeko Suzuki, Fumikazu Akamatsu, and Takashi Korenaga
- P55 Site-specific  $^{13}\text{C}/^{12}\text{C}$  analysis of alanine by NMR  
Y.C. Saigusa, Yoshito Chikaraishi, Y. Takano, H. Kitazato, and N. Ohkouchi
- P56 An improved method for the measurement of isotope ratio of ethanol in various samples, including alcoholic and non-alcoholic beverages  
Ryota Hattori, Keita Yamada, Yuji Ito, Yuji Sakamoto, and Naohiro Yoshida
- P57  $\delta^{34}\text{S}$ -value measurements in food origin assignments and sulphur isotope discriminations in plants and animals  
Nicole Tanz, Hanns-Ludwig Schmidt, and Robin Sutka