List of Dissertation Abstract　(Department of Artificial Environment)			
Name	Supervisor	Title	Abstract
Ryoma AIHARA	Tadahiro SHIBUTANI	Verification of effectiveness of condition based maintenance method using lubricant analysis and machine learning for marine diesel engine	In monitoring the state of a marine engine, a method using lubricating oil analysis has attracted attention because of its high accuracy of abnormality detection. The existing method focuses on iron abrasion powder that is constantly generated during operation, and detects anomaly from changes iron concentration in the oil. In this study, we propose a new condition-based monitoring method that can be for stepwise state estimation and easy border of setting, which are issues of the existing method, by combining machine learning with the existing method, and verify its effectiveness.

Shiho ASANO	Hideo OHTANI	A new method for predicting upper explosion limit of alkane/nitrous oxide/inert gas mixtures	The objectives of the present study are to experimentally reveal the effect of inert gas to upper explosion limit of alkane/nitrous oxide (N2O) mixtures and to develop a new method for predicting upper explosion limit for these mixtures. We used methane and propane for alkane, argon, nitrogen and carbon dioxide for inert gas. The experiments were performed at an initial pressure of 101.3kPa and an initial temperature of 298K. The prediction method used the VAFT method that changes the adiabatic flame temperature. It was clarified that the experimental value and the predicted value of the explosion limit using the VAFT method showed good agreement.

Hiroharu ARAI	Satoshi NAKAI	Validity of the distribution of NO2 concentrations in Yokohama City, Japan predicted by a Land Use Regression model	We investigated the validity of the LUR model to check whether it could be used as an exposure assessment method of NO2 air pollution in epidemiological studies in Yokohama city.The result that differences between predicted and measured values for NO2 concentration at 48 out of 55 residences were <0.005 ppm and at 16 sites were ±0.001 ppm or less, confirming that the model could satisfactorily estimate NO2 levels in residential areas of Yokohama city. Predicted concentrations at seven residences were ≥0.005 ppm higher than the measured concentrations. The maximum difference was 0.011 ppm at a residence facing a road that carries heavy traffic.

Erisa IIDA	Masaru OYA	Examination on separation and analysis of oily components in nonionic surfactant wastewater by n-hexane extraction	The wastewater after washing the oily dirt often becomes an emulsion. Emulsions can hinder the analysis of oil in wastewater. In this study, we analyzed the oil content of such wastewater with reference to "n-hexane extraction" specified in JIS, collected knowledge on analysis, and examined effective analysis methods. As a result, the method using the adsorption / desorption phenomenon was found to be superior, and a method capable of analyzing 80 to 100% of oily dirt in wastewater was established.
Ryota ISHIDU	Toshihiko SHIRAISHI	Cooperative Object Transportation System by Swarm Intelligence	The learning ability of a swarm composed of the Boid units was studied through a cooperative object transportation task. A cooperative transportation task of different-sized objects to the proper destinations placed in a 2-dimensional plane by multiple Boid units was simulated. Considering Boid units as the cell bodies in an artificial neural network, the learning algorithm of neural network was applied to the network of Boid units. As a result, the network of a swarm had acquired how to transport objects to their appropriate goals by training repetition of transportation.

Tomoaki IZUHARA	Tadahiro SHIBUTANI	Elucidation of vibration fatigue mechanism of automotive aluminum electrolytic capacitor	In order to improve the vibration resistance of aluminum electrolytic capacitors for automotive use, research was conducted to clarify the vibration fatigue mechanism of aluminum electrolytic capacitors for automotive use. The vibration fatigue mechanism was clarified by comparing and considering the fatigue life of the lead wire obtained by the vibration test and the fatigue life assuming the vibration fatigue mechanism. From the results, it was found that the vibration fatigue of the aluminum electrolytic capacitor for a vehicle is largely affected by the force applied from the substrate deformed by the vibration.

Yoshinori IWAMA	Kiyoshi HONDA	Cross [2+2] cycloaddition reaction under green light irradiation using thioxanthykium-based organic photoredox catalyst	In this study, we report a new method for synthesis of cyclobutane compounds. By using thioxanthylium salt as organic photoredox catalyst, we developed a cross [2 + 2] cycloaddition reaction with two kinds of styrene derivatives under visible light irradiation. Compared with other organic photoredox catalysts, it was found that the positional relationship of the electrical potential between the substrates and the catalyst was an important factor in catalyzing the reaction. Furthermore, this reaction was applicable to the β -halo styrenes that had not been reported before.

Ko UENO	Kiyoshi HONDA	A synthetic method for constructing asymmetric 1,1'-spirobiindene derivatives and the functional group transformations at the 2- and 3-positions of the 1,1'-spirobiindene derivatives by some unusual reactions	Asymmetric 1,1'-spirobiindenes are compounds applicable to various fields such as asymmetric synthesis and functional materials. A synthetic method for constructing asymmetric spirobiindene derivatives has been established in a convenient seven-step sequence featuring asymmetric double C-H insertion reaction and optical resolution by recrystallization. In the course of the investigation of the functional group transformations at the 2- and 3-positions of the 1,1'-spirobiindene derivatives, some unusual reactions such as double lactonization reaction were found. In addition, the conversion of them to π-conjugated compounds such as helicene derivatives and thiopyrylium salts was also described.

Masahiko UTOGUCHI	Kiyoshi HONDA	Synthesis of novel 1,1'-spirobiindane-based chiral bishydroxamic acids and application to asymmetric epoxidation of o-allylphenol	Hydroxamic acids have been used as chiral ligands because of their relatively high metal-binding ability. Recently, 1,1´-spirobiindane is drawing attention as a useful flamework of ligands because of its rigidity and C2 symmetry. In this work, I aimed at the following two things: 1) synthesizing enantiopure 1,1´-spirobiindane-based bishydroxamic acid, (R)-spiroBHA derivertives from dibenzosuberenone which is commercially available compound and 2) using these compounds as asymmetric ligands for asymmetric epoxidation of o-prenylphenol. As a result, I synthesized nobel five (R)-spiroBHA derivatives and asymmetrically epoxidized o-prenylphenol with up to 61% yield and 49% enantiomeric excess.

Kazuki KATO	Akihiko ITO	Preparation of Sr-Fe-O system films using chemical vapor deposition	Materials in Sr–Fe–O system have excellent magnetic, electrical, and photocatalytic properties. These films are expected to be applied to magnetic record media and solid oxide fuel cell. However, conventional film preparation methods have disadvantages such as low deposition rates or contamination of impurities. In the present study, Sr–Fe–O system films were prepared using chemical vapor deposition (CVD) and the effects of deposition conditions on the phase compositions, crystal orientations, and microstructures were investigated.
Moe KAWANISHI	Satoshi NAKAI	A study of environmental pollution due to heat-not-burn tobacco and electronic tobacco	Concentration of various substances emitted from various types of heat-not-burn toobacco (HNB) and electronic cigarettes (E-cig) were continuously measured. Concentrations of the substances from HNB and E-cig were different among brand names and flavors and lower than those from conventional tobacco. However, it is necessary to conduct further studies to investigate the characteristics and environmental standards/guidelines.

Akari KITAMURA	Akihiko ITO	Preparation of TiO2–WO3 composites using metal-organic chemical vapor deposition and their photocatalytic activities	TiO2–WO3 films were prepared on a graphite rod using metal-organic chemical vapor deposition. The obtained films were indexed to r-TiO2 (rutile TiO2) and γ-WO3. The r-TiO2 film showed a feather-like structure. The γ-WO3 film and r-TiO2–γ-WO3 laminated film showed a columnar structure. The decomposition of methylene blue solution by TiO2–WO3 composite was examined using ultraviolet-visible spectrophotometer and the r-TiO2 film with a feather-like structure showed 20 times higher photocatalytic activity than the γ-WO3 film. The feather-like structure r-TiO2 film exhibited the highest photocatalytic activity because of its large specific surface area.

Masayuki KIMITSUKA	Satoshi NAKAI	Study on factors of mass concentration difference of PM2.5 with and without denuder	Denuder method is measuring the mass concentration of PM2.5. In previous studies, comparative measurements of PM2.5 mass concentration with and without denuder have been performed. Measurements with acidic and basic denuders showed an increase in mass concentration in summer, but the cause is unknown. In this study, we focused on the fluctuation of weather and air pollutants and performed the PM2.5 mass concentration measurement by the denuder method from May to October and examined whether the weather and air pollutants affected the difference of the measurement results. As a result, it was found that O3 affected the mass concentration.
Yiming ZHANG	Daisuke NARUMI	Research on Cost-Benefit Analysis of High Reflrection Measures for Reducing Heat Island Risk	This thesis shows the cost-effectiveness of high reflection measures in a city. First, we calculated the benefits by high reflection measures based on the air temperature sensitivity of properties, such as energy and resource consumption, human health. Afterward, we divided the benefits into the cost of implementing high reflection measures, and finally, we sought the cost-effectiveness of high reflection measures in a city.

Yuto KOIZUMI	Atsumi MIYAKE	Study on decomposition mechanism of dimethyl sulfoxide	Dimethyl sulfoxide (DMSO) is widely used in chemical industries, because of its high dissolving ability and low toxicity. It is well-known that DMSO is highly stable at temperatures below 150 ° C. On the other hand, DMSO has high energy enough to cause explosion and several accidents in laboratories and chemical processes have been reported. Therefore, it is important to obtain information regarding autocatalysis and to understand how we can handle DMSO safety. The purpose of this study is to get better understanding of decomposition mechanism of DMSO.
Ayumi GOTO	Toshihiko SHIRAISHI	A Study on Effects of Mechanical Vibration on Proliferation and Differentiation of Cultured Osteoblasts	Mechanical vibration has effects on proliferation and differentiation of osteoblasts. Some reports suggest these effects depend on frequency of vibration, but it has been unclear whether the influence of the sloshing of culture medium which occurs at the particular frequency is included in these frequency dependent effects. Therefore, the objective of this study is to clarify the frequency dependent effects of mechanical vibration by the experimental investigation about the influence of the sloshing.

Emika SATO	Akihiko ITO	Preparation of Lu2Ti2O7 thin films using pulsed laser deposition	Lu2Ti2O7 thin films were prepared on fused quartz, Si and yttria-stabilized zirconia (YSZ) substrates using pulsed laser deposition (PLD). Lu2Ti2O7 thin films deposited at room temperature under high vacuum ambient were amorphous on each substrate. The thin films deposited on fused quartz and Si substrates were crystallized into a pyrochlore structure with a significant (222) orientation after heat treatment at 1073–1273 K. The thin films deposited on (100) and (111) YSZ substrate were crystallized as (100) and (111) Lu2Ti2O7 epitaxial thin films, respectively, with in-plane orientation relationships.

Tatsuhiro SATO	Takashi KAMEYA	Development of a method to evaluate the risk of air pollutants around business sites	Twenty years have passed since the PRTR Law was enacted, but 90% or more of chemicals are released to the atmosphere, and the environmental risks around the business site are unknown. The reason is that existing risk assessment tools are not fully utilized. In this study, a scaling method (control banding method) was developed as a simple risk assessment method that does not require difficult risk analysis techniques or tasks. This tool is very simple in that an evaluator can perform a risk assessment only by selecting and adding a parameter scale in a worksheet.
Yusuke SATO	Takashi KAMEYA	Separation and Purification of Analytical Interferences in Mass Spectrometry of Environmental Pollutants	In this study, regarding to mass spectrometry of sewage samples containing a large amount of contaminants, we attempted to separate and purify from the eluate sample or separation and purification by changing the eluent for the purpose of separation and purification of contaminants. Considering the quantitative reliability required for the analysis, a method for improving the influence of impurities was examined.

Ryunosuke SHIBATA	Toshihiko SHIRAISHI	A study on the role of G protein coupled receptor 143 (GPR143) in temporal lobe epilepsy	Temporal lobe epilepsy (TLE) is the most common form of epilepsy. The hippocampus, located in the mesial temporal lobe, is implicated in the development of TLE. However, mechanisms underlying hippocampal epileptogenesis in TLE remain unclear. Here, we investigated whether G protein coupled receptor 143 (GPR143), which is highly expressed in the hippocampus, is involved in hippocampal epileptogenesis in TLE. We induced limbic seizures by administration of kainic acid.
Takeshi SUZUKI	Toshihiko SHIRAISHI	Study of the spur gear noise characteristic by photoelasticity	Gears have been used for a long time as important mechanical elements. It is said the history of gears have started from BC. Despite the long history, the mechanism of noise generation has not been clear. There are many previous studies. But no one studied visualizing strain distribution of gear in dynamic state. For this reason, objective of study is to clarify the relation between strain distribution of gear in dynamic state to gear noise. . For this purpose, a transmission model was designed and constructed. Feature of this model is to be visualized the strain distribution in operation by using photoelasticity.

Tomoya SUZUKI	Atsumi MIYAKE	Quantitative risk analysis based on physical modeling for hydrogen refueling stations	The purpose of this study is to improve risk analysis based on more realistic physical phenomena in a hydrogen refueling station process. Focusing on the "physical modeling" that models the target system by combining the basic physical equations that dominate the target system, we performed a consequence and risk analysis quantitatively using the discharge rate of hydrogen leak based on more realistic physical phenomena. It was possible to analyze separately the risk of leakage from the upstream and downstream sides of the process.

Masayuki SOEJIMA	Kazuhiko NOGUCHI	A framework of chemical accident prevention plan for public safety	Safety measures for citizens in the event of chemical disasters affecting off-site occurs is not enough compared to measures for citizens in the event of natural and nuclear disasters. The purpose of this study is creating a framework of chemical accident prevention plan for public safety. Citizens' requirements were logically examined using logical analysis such as Fault Tree Analysis (FTA), and it was extracted that the government and the chemical plant operators needed to prepare in advance. The research results will provide information that will help formulate evacuation plans for chemical accident and contribute to the safe evacuation of citizens.

Eri TAKAKUSAKI	Akihiko ITO	Synthesis of silica-based composite materials by chemical vapor deposition	Amorphous silica has excellent corrosion resistance and heat resistance and is used for insulating coatings and heat and corrosion resistant coatings. In this study, amorphous silica film was formed on carbon fiber and carbon rod by MOCVD method, and the effect of film formation temperature and carrier gas flow rate on film formation were investigated. In addition, hollow fiber-shaped and rod-shaped amorphous SiO2 films were synthesized by heat-treating the formed samples in an oxygen atmosphere, and the effect of the difference in film thickness on the heat treatment results was examined.

Junpei TAKAHASHI	Takashi AMEMIYA	Glycolytic oscillations in speroids of HeLa cells	In previous studies, HeLa cells (human cervical cancer) were cultured in a monolayer, and the glycolytic oscillations were observed. In this study, HeLa spheroids (cells cultured in 3D) were formed in order to observe in conditions similar to tumors, an d we successfully observed glycolytic oscillation s in cancer spheroids for the first time. We compared HeLa spheroids to cells cultured in a monolayer, and evaluated influence of 3D cultured (high cell density, upregulation of cell cell communication) on glycolytic oscillations. Different periods of glycolytic oscillations in HeLa spheroids or in HeLa cells in a monolayer culture are observed and it was suggested enzyme activities were changed in spheroids culture.

Masaki TANAKA	Masaru OYA	Development of the washing evaluation system of the nonpolar oil soils by the image processing	I suggested the system of the washing evaluation of the nonpolar oil soil using the image by a digital camera. I performed the image shooting under the visible light condition, the ultraviolet rays condition. The ultraviolet absorption method using the contrast of the soil adhesion point with soil were effective while I examined a visualization method of the colorless oil. I was able to evaluate it for the heterogeneous dirty cloth exactly and easily by calculating quantity of dirt of each pixel than a conventional method.
Yosuke TANIGUCHI	Masaru OYA	New Method for Estimating Additive Effect or Synergic Effect in Removal Process of Soils and Dyes from Fabrics.	In the washing phenomenon, various conditions such as detergent concentration and temperature interact in a complicated manner, and an analysis method has not yet been established. Our group has analyzed the cleaning phenomenon using a unique method called the probability density function method. This time, it was suggested that this method could be used to determine the additive / synergistic effect of the two washing conditions. If this determination is possible, it is considered that more effective cleaning conditions can be clarified.

Yusuke TSUCHIDA	Masahiko MATSUMIYA	Analysis of electrodeposition behavior for extracted platinum group complex in ionic liquid system by EQCM with elevated temperature	It is important to develop the extraction and electrodeposition processes of the platinum group metals in order to reduce the volume reduction of secondary wastes. The electrodeposition behaviors of the extracted Pt(IV) complex in [P2225][NTf2] ionic liquid were investigated by Electrochemical Quartz Crystal Microbalance (EQCM) with elevated temperature in this study. It was revealed that the charge transfer reaction: Pt(IV)+2e-→Pt(II) was observed at -0.53 V and the electrodeposition reaction: Pt(II)+2e-→Pt(0) was proceeded in this system around -1.65 V at 373 K considering from Mapp=197.5 evaluated by CV/EQCM method. Moreover, the alternation of $\Delta \eta \rho$ for Pt(II)/Pt(0) was corresponded to the locally decrease of the viscosity of IL near the electrode.

Yuji TSUNOKUMA	Hideo OHTANI	Synthesis and Combustion Efficiency of Iron Perfluorocarboxylates	In this study, iron perfluorocarboxylates with iron that exhibits low toxicity and high combustion surpression efficiency, and that have perfluro groups were synthesized and the combustion surpression efficiency was investigated. Instrumental analysis methods such as mass spectrometry were used to determine characteristics such as the composition of the synthesized compounds. As a result, the synthesized compounds did not show ability to extinguish flame, however a large combustion suppression effect was seen in a low concentration range. Furthermore, thermal analysis indicated that suppression of combustion occurred not in the solid phase but in the gas phase.
Ryo NIWANO	Hiroki HINDO	A feasibility and cost-benefit analysis of OTEC systems when considering co-benefits	OTEC emits low CO2 so OTEC is expected to against climate change. In addition , the multi-use deep sea water can provide co-benefits ,and is expected to the promotion of remote island . This study is quantified these co-benefits and identified the region where feasibility of OTEC considering co-benefits.

Takatoshi HASE	Toshihiko SHIRAISHI	A Study on Levitating Objects by Acoustic Holography	In this study, the simulation was experimentally verified in order to design the device for object levitation using acoustic holography. The target objects to be levitated were small styrene-foam spheres. First, in order to realize the object levitation, the input signals to the transducers were adjusted to reduce individual differences in the output. Next, the levitation height of the object was measured the results are compared with the simulation results. As a result, the validity of the simulation was shown under the specific conditions.

Tomomi HAYASHI	Takeshi KOBAYASHI	Analysis and Evaluation of the Diffusion of Chlorinated Volatile Organic Compounds in Unsaturated Zone	The underground leakage of solvents containing Chlorinated Volatile Organic Compounds (CVOC), which were widely used in factories in the past, causes the environmental problem. In unsaturated zone, CVOC may be transported as vapors by diffusion from saturated zone. The aim of this study is to discuss what parameters of the soil affect diffusion and diffusion mechanisms when the CVOC vapors diffuse from contaminated groundwater to the unsaturated zone. The results show that the VC vapor tended to diffuse more easily than PCE, TCE and DCE. Additionally, it was revealed that the mechanism depends on the liquid phase volume ratio and the affinity of each substance.

Yumi HIROOKA	Kenji ARAMAKI	Creation of liquid crystal nanoparticles by polyglyceryl tocopheryl ether	Liquid crystal nanoparticles (LCN) formed from reverse bicontinuous cubic liquid crystals or reverse hexagonal liquid crystals, which are non-lamellar liquid crystals (NLLC) phase, have attracted attention as a drug carrier in a drug delivery system. In this study, we succeeded in the creation of LCN, which is expected to be stable at low temperature, using polyglyceryl tocopheryl ether. In the experiments, the structure analysis of the NLLC phase using small-angle X-ray scattering and the particle size measurement of LCN using dynamic light scattering were mainly performed.

Toshihiro FUJIWARA	Hiroyuki OTANI	Synthesis, Structure, and Properties of Macrocyclic π-Extended Thiophene 6-mers with Four Substituents	π-Extended macrocyclic thiophene 6-mers 6T4A-4R can control their crystal structure and morphology with substituents. I investigated molecular stacking in the solid state, by measured FET behavior of films of 6T4A-4Et and 6T4A-4Bu. 6T4A-4Bu showed conductivity due to stacking structure before annealing. However, 6T4A-4Bu exhibited FET behavior after annealing at 100 ° C due to the structural change on the surface. In addition, Structures and electronic properties of cationic species derived from 6T4A-4Bu were investigated. Interestingly, radical cation (6T4A-4Bu)・+ showed self-association behavior to make π-dimer [(6T4A-4Bu)2]2+. The crystal of π-dimer forms three-dimensional conjugated 70 π-electrons system.

Ryosei HOSHINO	Yoshimi TANAKA	Importance of branches and leaves in the oscillation mechanism of trees	Experiment and numerical calculation are carried out on oscillation behavior of trees, based on the assumption that branches and leaves play an important role in the damping of the oscillation of trunk. First, we show experimental results for oscillation behavior of trees (Japanese Bigleaf Magnolia) and derive mechanical parameters (natural frequency of oscillation and damping rate etc.) from the data. Then, we construct, using the parameters, a simple mechanical model of a combination of mass-spring-damper elements. The consistency between the data and the model prediction remains on a qualitative level, implying that the model does not include essential factors. The factors are probably the branch structure of the leaves and the network of the whole tree.

Miho MAEDA	Kenji ARAMAKI	Formulation of hydrogel by surfactant mediated gelation method	Gels are used in various fields such as foods, cosmetics, and medicines. Self assemblies of surfactants have functions such as solubilization, and the gel networks formed by gelators make gelled solution. It is expected that highly functional soft matter can be formed by constructing an orthogonal system in which aggregations of surfactants and gel networks coexist without interfering with each other. To solubilize organic gelator in surfactant micelles, hydrogels are prepared with organic gelator. By this surfactant-mediated gelation (SMG) method, we obtained gelled micellar solutions with nonionic surfactant (Tween 80) and low-molecular organic gelator (12-HOA)

Tatsuya MASUDA	Daisuke NARUMI	Effects of People's Values and Energy-Cognition on Energy-Saving Behavior —A Case of Family Households Living in Greater Tokyo Metropolitan Region—	This study examined how psychological factors, such as values and consciousness, affect energy-saving behavior and energy consumption. In terms of value, the social value group has the highest energy saving thinking, and the mixed group of personal and social value has the second highest energy saving thinking. Furthermore, it was found that values strongly influence the energy-saving behavior index, and that the degree of whether or not to act directly affects energy consumption.
Masaki MATSUNAGA	Naoya KASAI	Research on Multi-coils Eddy Current Testing Probe with Simulation Analysis	Uniform eddy current testing (UEC) is a nondestructive testing method to detect cracks of material surface. UEC probes have the advantage of the ability to eliminate lift-off noise over conventional eddy current ones. We developed a new UEC probe model with pancake orientation, which placed excitation coils and a detector coil parallel, then compared it with conventional tangential orientation. As a result of numerical simulation and experiment on aluminum plate, we found that UEC probes with pancake orientation was better than tangential one on signal amplitude.

Kota MATSUBARA	Hiroyuki OTANI	Synthesis, Structure, and Properties of π-Extended 5,5'-Bitroponoid Molecules	Troponoid molecules are stable 7-membered ring non-benzenoid aromatic compounds characterized by a large permanent dipole moment and form chelate complexes with various divalent transition metal ions via the carbonyl oxygen and vicinal substituents. I investigated structure and physical properties of new π-conjugated molecules incorporating troponoid molecules. I report the synthesis, structure, optical properties, and oxidation properties of novel dimeric complexes of 5,5'-bitroponoid molecules extended with 1,8-diethynylanthracene. Furthermore, the unique electronic structures and the optical properties of the radical cation and the dication of these dimeric complexes were discussed. In addition, the synthesis, structure, and fluorescence properties of the terphenyl type 5,5'-bitroponoid molecules were investigated.

Shogen MATSUMOTO	Akihiko ITO	Preparation of Al2O3–HfO2 and Al2O3–Lu2O3 composite films using chemical vapor deposition	HfO2–Al2O3 and Lu2O3–Al2O3 systems are promising materials for environmental barrier coatings and radiation imaging films due to their excellent thermal, mechanical, and optical properties. In present study, HfO2–Al2O3 and Lu2O3–Al2O3 films were prepared using chemical vapor deposition, and the effects of deposition conditions on microstructure and material properties were investigated.
Yutaro MIURA	Hideo OHTANI	Explosion characteristics of a substance causing a cool flame phenomenon in an oxygen atmosphere	The upper limit of combustion of acetaldehyde, methyl formate, and diethyl ether, which can cause a cool flame phenomenon in an oxygen atmosphere, was investigated, and the equilibrium composition at the upper limit of combustion was investigated using chemical equilibrium calculation software. In addition, the adiabatic flame temperature was similarly examined. In addition, from those information, we investigated what kind of substances could explain the upper limit of combustion at the upper limit of combustion of acetaldehyde, methyl formate, and diethyl ether using the method called VAFT method.

Ryo MIYAKAWA	Takeshi KOBAYASHI		Soil and groundwater pollution by volatile organic chlorine compounds (CVOC) has become apparent. When high concentration of CVOC penetrates into an impermeable layer such as clayey soil, purification becomes very difficult. In addition, even if the groundwater is purified, the site where the CVOC remaining in the cohesive soil elutes into the groundwater and recontaminates is also a problem, and it is necessary to understand the long-term elution behavior in cohesive soil and elucidate the elution mechanism. In this study, we elucidated the mechanism of elution behavior of CVOC in cohesive soil, modeled the elution behavior, and examined the concept of judging the end of purification.

Ryoya MOCHIDUKI	Atsushi SUZUKI	Effect of Radiation-Induced Crosslinking on Frictional Properties of Physical Poly(vinyl alcohol) Hydrogels	Poly(vinyl alcohol) (PVA) gel has high biocompatibility, excellent mechanical properties, and water retention, and is a candidate material for artificial joint cartilage. For the practical application, the elution of uncross-linked PVA, which is inevitable phenomenon for physical gels, should be prevented or minimized. In this study, we introduced chemical cross-links in hybrid gels by irradiation with a γ-ray or an electron beam. As a result, the gel fraction increased to ca. 90% with the total dose above 20 kGy of the γ-ray and electron beam irradiations. The irradiation conditions for the irradiation of γ-ray or electron beam for hybrid gels to retain excellent friction characteristics were optimized.

Kanae MORI	Mieko KUMASAKI	Synthesis and thermal analysis of novel energetic materials from teiazole derivatives with controlled electronic states using electrochemical oxidation	Previous studies about mixing azoles with metal ions and organic substances with electron-withdrawing properties suggest that the electronic state contributes to the thermal behavior of energetic materials. In my studies, electrochemical oxidation was selected as a new method for controlling the electronic state of energetic materials. The synthesis and thermal behavior of a new energetic material that combines an electrochemically oxidized energetic cation and an oxidant anion were studied.
Kana WATANABE	Hideo OHTANI	Combustion inhibition effects of M(Ⅱ)-DPPF complex	This study was performed to evaluate the combustion inhibition effects of M(Ⅱ)-DPPF complex for getting knowledge of new fire extinguishers and improving combustion inhibition effects of polynuclear complex. Co-DPPF and Zn-DPPF expressed effects in combustion inhibition higher than not only DPPF but also the mixture of DPPF and metallic chloride by experiments in combustion of filter papers. Therefore, it was clarified that polynuclear complex, for example, M(Ⅱ)-DPPF had synergy in combustion inhibition effects.

Lujia SHI	Satoshi NAKAI	The study of exposure assessment of chemicals from consumer products with life・action pattern data	This study, based on the results of the life・action pattern questionnaire,　started from data cleaning and examine the changes in each action time performed at the home where the exposure coefficient was reached. It also estimate the individual exposure of all the respondents to the questionnaire, and to determine the distribution of the estimated exposure by age group or region in Japan.

Jun XU	Daisuke NARUMI	Impact of Adaptation on Indoor Thermal Environment and Energy Consumption in A Densely Populated Urban Area	There are many wooden houses which have lack of thermal insulation in densely populated urban area and they can be the reason leading to energy increase. There are also a large percentage of the elderly living here and, due to the lower heat tolerance towards the temperature, they are more likely to get heat stroke both indoor and outdoor in summer. Besides, when setting the policy towards renovation here, the government do not take the thermal environment into consideration. Based on this background, this paper reported the thermal insulation effect in different densities. And, this paper also discussed the reduction effect on energy consumption, indoor thermal environment and indoor heat risk by using adaption strategies for climate change in Detached houses in a densely populated urban area. Finally, doing a proposal.

Lin TONG	Yoshikazu SHUSA	Impact of Service Platform Enterprises' Strategies　on Traditional Businesses　－Focus on Research of China and America Newspaper Company's Ambidextrous Organization―	Many previous studies have suggested that strong leadership is an essential factor in the successful management of an ambidextrous organization.However, Chinese newspaper companies can successfully operate their ambidextrous organizations even if they don't have strong leaderships. As a result of the case analysis, regardless of leadership, there are small changes happened from the bottom to the top of companies' organization, gradually affecting the management of the it. Finally, they transform into ambidextrous organization naturally, which is the conclusion of my paper.
Yosuke TANIGUCHI	Masaru OYA	New Method for Estimating Additive Effect or Synergic Effect in Removal Process of Soils and Dyes from Fabrics.	In the washing phenomenon, various conditions such as detergent concentration and temperature interact in a complicated manner, and an analysis method has not yet been established. Our group has analyzed the cleaning phenomenon using a unique method called the probability density function method. This time, it was suggested that this method could be used to determine the additive / synergistic effect of the two washing conditions. If this determination is possible, it is considered that more effective cleaning conditions can be clarified.

Nagisa YAMANOBE	Mieko KUMASAKI	Study for the cause of induction period of H2O2/CuCl2	Hydrogen peroxide is one of the widely used chemical material. On the other hand, it is so unstable that it caused many accidents in past. It has been suggested that when mixed with copper chloride, an induction period occurs. But we didn't have enough knowledge about this mixed system's phenomenon. The purpose of this study is to unveil the cause of the induction period in the mixed system of hydrogen peroxide and copper chloride.