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| Division of Natural System | Research field | Thermofluid and Particle System | Lab. ID |
| | | | NS16 |
| Laboratory web site | http://aerosol.w3.kanazawa-u.ac.jp/ | | |
| Research subjects | | | |
| <p>Aerosol is a system composed of small liquid or solid particles suspended in gas. In our laboratory, formation, measurement and control of aerosol particles are investigated to apply these aerosol technologies to various fields such as material science, energy and environments and human health. Development of energy utilization technology is also our main topic. In particular, high density adsorption heat pump composed of fine particle accumulated metal surface is studied. Control technologies of fine particles were also under development such as centrifugal and inertial separator, nanofiber, PM2.5 measurement device and ventilation of mist and fume. For the nanomaterial production, laser ablation and supercritical fluid techniques are also investigated to fabricate nanodevices for energy conversion and storage. New types of aerosol charger and microplasma ionizer are also under development for measurement of aerosol particles.</p> | | | |
| Master/Doctor course: Education policy, curriculum, typical activity in the laboratory | | | |
| <p>Each master course students have their own (original) research subject. Many subjects are related to collaborative works with companies and national institutes. PhD candidates will organize research team with master students and bachelor students as well as studying their own subject. All students are divided to approximately six research teams and team meeting is held every week. The student is recommended to present their research results at international conference.</p> | | | |
| Daily life in the laboratory, etc. | | | |
| <p>Many foreign students (mainly from Asia) are joining to our laboratory. We also have many collaborative researches with companies. The students have frequent chances to join recreation and party for training communication skills.</p> | | | |
| Message or comments by the laboratory faculty staffs | | | |
| <p>Our laboratory was established in 1968 and it has more than 40years history. Currently 5 professors and 2 staff and many (more than 50) students are studying in this laboratory. Main research topics are aerosol formation, measurement, filtration, environment, heat pump, biomass etc. We are working hard under the slogan of "enjoy studying!". We have much international collaboration as well as collaborative research with companies. Let us study together in our global laboratory!</p> | | | |
| Recent Master theses in these 3 years (+ more if appropriate) | | | |
| year.month | Thesis title (including English translation of Japanese thesis title) | | |
| 2017.3 | Effect of slip flow on collection performance of nanofiber filter | | |
| 2017.3 | Synthesis of nanoparticles by spark discharge and evaluation of their morphology | | |
| 2017.3 | Suppression of multiply-charged in microplasma aerosol charger | | |
| 2017.3 | Formation of solid adsorbent layer on aluminum sheet by using silane coupling agent | | |
| 2017.3 | Application of centrifugal filter to measurement of aerosol particle size distribution | | |
| 2017.3 | Evaporation and breakup dynamics of nanofiber by electrospinning | | |
| 2017.3 | Charge neutralization of electret filter by organic solvents and surfactants | | |
| 2017.3 | Centrifugal separator for PM2.5 | | |
| 2017.3 | Filtration performance of nano/microfiber mixed filter | | |
| 2017.3 | Improvement of dispersion performance of Super Jet Mill for submicron particles | | |
| 2017.3 | Flue gas sampling from incinerators | | |
| 2017.3 | Adsorption behaviors of methanol vapor on compacted activated carbon fiber | | |
| 2017.3 | Dynamics of highly charged nanodroplets generated by electrospay | | |
| 2016.9 | Effect of background gas on graphene formation by laser ablation | | |
| 2016.9 | Application of centrifugal filter to air cleaning equipment | | |
| 2016.9 | Growth process of atmospheric nanoparticles in Fukue Island | | |
| 2016.3 | Sieving of aerosol particles with metal screens | | |
| 2016.3 | Measurement and collection of oil mist generated by manufacturing processes | | |
| 2016.3 | Localized deposition of aerosol particles by electrostatic focusing | | |
| 2016.3 | Measurement and collection of particulate matters generated in soldering reflow furnace | | |
| 2016.3 | Development of acceleration test for predicting HVAC filter life | | |
| 2016.3 | Effect of filter media properties on collection performance of centrifugal filter | | |

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| 2016.3 | Preparation of metal salt/anodized alumina composites and their water vapor sorption characteristics |
| 2016.3 | Quantum properties of morphology-controlled silicon nanoparticles synthesized by laser method |
| 2016.3 | Effect of filter structure on cleaning performance of bag filter |
| 2016.3 | Effect of surrounding fluids on morphology of carbon nanoparticles generated by laser ablation |
| 2016.3 | Pyrolysis of Mongolian brown coal |
| 2016.3 | Synthesis of silicon nanowires by laser ablation |
| 2016.3 | Development of electrostatic precipitator for welding fume |
| 2016.3 | Evaporation of multiply charged nanodroplets generated by electrospray |
| 2015.9 | Effect of filter inhomogeneity on reduction of pressure drop due to slip flow |
| 2015.9 | Development of single particle trap system for aerosol visualization |
| 2015.3 | Compression Molding Mechanisms of Mesoporous Silica Adsorbent and Its Water Vapor Adsorption Characteristics |
| 2015.3 | Development of Activated Carbons with Large Specific Surface Area densified by the addition of PTFE |
| 2015.3 | Development of High-efficiency Aerosol Charger with Suppression Multiply-Charged Particles |
| 2015.3 | Sintering, Crystallization and Surface Reaction of Silicon Nanoparticles Suspended in a High Temperature Reactive Gas |
| 2015.3 | Observation of Atmospheric New Particle Formation in Fukue Island |
| 2015.3 | Dry Dispersion Mechanisms of Submicron Particle Aggregates by Super Jet Mill |
| 2015.3 | Development and Evaluation of Air Filter for Mist Removal |
| 2015.3 | Graphitization of Quartz Surface by Laser-induced Backside Reactive Deposition |
| 2015.3 | Molecular Dynamics of Competitive Evaporation of Solvent and Ion from Highly Charged Nanodroplets |
| 2014.9 | Effect of Humidity on Plasma Decomposition of Naphthalene Vapor |
| 2014.9 | Particle Collection Performance of Air filters in Cyclic Flow |
| 2014.3 | Enlargement of porous diameter of alumina thick film and deposition of Calcium chloride |
| 2014.3 | Formation of aluminum oxide film by constant voltage cathode oxidation |
| 2014.3 | Water vapor absorption characteristic of mesoporous silica/metal complex material |
| 2014.3 | One step synthesis of core shell nanoparticles with Si core by laser ablation |
| 2014.3 | Application of PM0.1 filter for chemical analysis of atmospheric nanoparticles |
| 2014.3 | Development of mobility spectrometer combined with microplasma ionizer |
| 2014.3 | Deposition of macromolecular ion with controlled charge state on solid surface |
| 2014.3 | Measurement and collection of welding fume in the manufacturing of large machinery |
| 2014.3 | Fabrication of nanoparticle accumulated film by transfer of nanoparticles collected on air filter |
| 2014.3 | Effect of nanofiber accumulation on the performance of air filter |
| 2013.3 | Basic study of rapid thermal decomposition of wood skin |
| 2013.3 | Development of complex materials for low pressure water vapor absorber |
| 2013.3 | Preparation of activated carbon fiber adsorption material with deposition of Calcium chloride |
| 2013.3 | Development of new type atomizer for analyzing nanoparticles in ultrapure water by spray dry method |
| 2013.3 | Synthesis of silica/Ito composite materials by spray pyrolysis |
| 2013.3 | Laser induced nanostructuring of aerosol carbon nanoparticles |
| 2013.3 | Dispersion of submicron powder by jet mill |
| 2013.3 | Analysis of Heat and Mass Transfer in Porous Ceramic Substrate for Green Roof Topping |
| 2013.3 | Effect of artificial polymer on the ice nucleation on AgI surface |
| 2013.3 | Formation of growth of nanoparticles by ozone oxidation of isoprene |
| 2012.9 | Preparation of air filter test aerosol by dispersion of powder |
| Recent Doctoral theses in these 3 years (+ more if appropriate) | |
| year.month | Thesis title (including English translation of Japanese thesis title) |
| 2016.9 | Structural Control of Nanoparticles and Thin films by Laser Ablation |
| 2016.3 | Water vapor sorption on metal salt-anodized aluminum composites for sorption |
| 2015.9 | Development and evaluation of high performance air filter for mask |
| 2015.9 | Control of charge state of aerosol particles in industrial process |
| 2014.9 | Nucleation and growth of atmospheric nanoparticles |
| 2014.3 | Formation of charged nanodroplets and its characteristics |
| 2013.3 | Characterization of Surface Dielectric Barrier Discharge and Its Application for Decomposition of Polycyclic Aromatic Hydrocarbons |
| Laboratory mail address | |
| Yoshio Otani <otani@se.kanazawa-u.ac.jp> | |