

List of Dissertation Abstract (Environment and System Sciences)

Name	Supervisor	Title	Abstract
Hideaki WATANABE	Kenji ARAMAKI	Effects of Crystal Structure on Brittleness and Dissolution Property of α -Sulfonated Fatty Acid Methyl Ester Salt (MES) Hydrated Crystals	α -Sulfonated fatty acid methyl ester salts (MES), which were made from vegetable sources, are attractive candidates for eco-friendly washing detergents. We studied how crystalline structures can affect the brittleness and dissolution property of MES grain. Our findings are useful for improving powder detergents.
Eiaku TANAKA	Mahito ATOBE	Development of Electrochemical Polymerization Processes Using Highly Concentrated Monomer Solutions	In this work, novel electrochemical polymerization processes using highly concentrated monomer solutions have been successfully developed. By using highly concentrated monomer solutions, electrochemical polymerization is achieved to overcome some problems in the conventional polymerization method.
Hiroshi FUKUMOTO	Seiya UENO	A Study on Trajectory Optimization for Minimum-Time Formation of Aircraft	This study presents a novel method to derive optimal trajectories for minimum time formation guidance by using reachability fronts in which each aircraft solves its own optimal control problems. The aircraft can be classified into ‘time-controlling’ aircraft which control the flight time, and the rest of them. This method facilitates the classification and has advantages as follows: a) computational time is not so sensitive to the number of aircraft; b) ‘non time-controlling aircraft’ are used effectively. Furthermore, this method is applied to obtain optimal trajectories and sequences for minimum-time approaching an air traffic flow of multiple aircraft. Numerical results show the effectiveness of this method.
Yang QU	Mahito ATOBE	Development of carbon-carbon bond forming reaction processes using electrochemical reduction	In this work, I have successfully developed a novel carbon-carbon bond forming reaction processes using electrochemical reduction. Because these reaction processes does not need for any transition metal catalysts, they are economically and environmentally attractive. In addition, it was also investigated application of the microreactor system in order to make the reactions more efficiently.

Kosuke IWAMOTO	Shin MORISHITA	Study on improvement of seismic isolation technology for severe earthquakes	Seismic response analyses in consideration of nonlinear characteristics of structure members are conducted to design facilities to be proof against severe earthquakes. New technologies of isolation systems are required to improve earthquake resistance. This study presents the results of a study to investigate the influence of nonlinear characteristics of rubber isolators and to develop the mechanism for preventing derailing of cranes.
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