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Treatment of Recalcitrant Organic Matter in Wastewater

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Conventional activated sludge process is biological treatment and BOD resolution will be done. But it's difficult to take COD of trouble resolvability apart and process it.

We have developed remarkable activator of a microorganism. This activator of a microorganism, remains COD is reduced and the ability of the activated sludge processing is improved.

The Technique of Curing Activated Sludge Treatment System and Odor Control during Shutdown

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To avoid any troubles in the pulp and paper wastewater treatment at the restart after “Shutdown”, it is necessary to restrain the decline in performance of the activated sludge treatment process : main process of the pulp and wastewater treatment, against extream load-fluctuation stress during “Shutdown”. So we have suggested the original program of curing activated sludge process during “Shutdown” for many factories.

As the schedule of “Shutdown” varies each time, we have to not just remake the program but correct it according to the actual transition of the load or condition of the activated sludge treatment process.

In this paper, we describe the technique of scheduling, simple confirmation way for the actual transition of the activated sludge treatment process, lead operation to a correct direction, and odor control during “Shutdown”.

Advanced Treatments of Waste Waters with Microbubbles of Ozone and Air

Yasuo Onari
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Different from the characteristics of millimeter size bubbles, microbubbles bear minus charge in those gas-liquid surface region, greater surface area and slow floatation speed in water. Microbubbles smaller than about 10 micron are also known to shrink easily by any physical shock to result bubble crash and hydroxyl radicals production. From these characteristics, microbubbles of ozone and air are expected to have high potential for removal agents of water contaminants such as hydrophobic materials and plus charged pollutants represented by proteins and microorganisms.

In this paper, by taking into account the retrofitting abilities of microbubbles, water treatments with ozone oxidations by using millimeter size bubbles were mentioned.

Waste water treatments of a fish food factory by using air and ozone microbubbles were examined and resulted good removal efficiencies of its pollutants. For biological filtration treatment of urine by using a soil bed permeation system, air microbubbles were shown to be a good support for aerobic condition keeping of the system and taking a new lease of the life of the the system.

Reduction of Water Usage at Niigata Mill －Toward Our Minimum Impact Mills－

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Hokuetsu Kishu Paper Co., Ltd (HKP) has set an approach of “Minimum Impact” to minimize all impacts on the environment. HKP has carried out much efforts of CO_2 emission reduction against global warming, air pollution and water pollution in order to establish our minimum impact mills. Particularly, HKP has been actively carried out a variety of initiatives and capital investment in Niigata mill, which is the largest mill in HKP.

We have the same approach for water-saving. Although the City of Niigata has much of water resources, the amount of our water intake is limited and we have carried out various efforts of water-saving as we expand a production capacity. In this paper, certain efforts of our water-saving at the time of constructing No. 9 paper machine are described.

Basic and the Case Study of Low-Frequency Noise Countermeasure in a Factory

― Listen and Feel How We Can Resolve the Noise Problem ―

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There are a lot of possibilities to provide the countermeasures for the noise problems in plant. Actually we have been seeing many cases, some of them are well-examined and effective, but some of them are very difficult to expect suitable noise reduction. In this presentation, we would like to introduce both effective and non-effective countermeasures.

And actual recorded and simulated noises are presented for helping to understand these differences. Also, examples for solving low-frequency noise are presented.

Actual Example of Vibration Trouble ―Search the Invisible Cause of Vibration Trouble ―

Akihiko Miyazaki
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At this seminar, we showed vibration control technology and the counter measures at actual sites in the customers. They are only parts of a lot of our experiences by the works at the sites.

However, we expect you may be able to take the right action at the first stage of the trouble and make an appropriate decision when you face to the trouble by knowing such our experiences.

As a result, you may reach the cause without detail investigation if the case is similar to it that you learned, and you may be able to solve the problem without unnecessary works. It will be a pleasure that our experiences help to solve your trouble.

Minamata Convention and Control of Mercury Air Emissions

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Ministry of the Environment Government of Japan

In order to ensure accurate and smooth implementation of the Minamata Convention on mercury, both "Act for the Partial Amended Air Pollution Control Law" (Law No. 41, on June

19, 2015), and "Ordinance for the Partial Amended Enforcement Order of the Air Pollution Control Law " (No. 379, on, November 11, 2015) were promulgated in the same year.

Furthermore, the discussion of specific emission standard value of each type and scale for the mercury emissions facility, and its measurement method was carried out, and the primary report for the implementation of mercury air emissions measures was compiled, based on Minamata Convention on the mercury in the Central Environment Council on June 14, 2016 as well.

Effluent Management with Bioassay ―from a Perspective of the Test Facility―

Atsushi Sawai
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Introduction of new effluent management procedure have been discussed at the committee of Ministry of the Environment, Japan from 2010. The existence of the effluent management with bioassay will be discussed in 2016, with the participation of newly selected committee member from industry. Introduction of new effluent management is considered as voluntary management system. The bioassay is considered three toxicity tests which are fish embryo larvae short term toxicity test, daphnia reproduction test and algae growth inhibition test. Some major company voluntarily addressed new effluent management with bioassay as part of activities for a conservation of biodiversity. Major issue facing test facilities are raring management of test animals, the cost of bioassay and accuracy management of bioassay.

New Indexes of Bottom DO and Coastal Transparency

Rina Miyake
Ministry of the Environment

It has passed more than 40 years since establishment of living environmental items of Environmental Quality Standards for Water Pollution (EQSWP) depending on the Environmental Basic Law. In the water environment situation changes, it is difficult for people to realize the conservation status of the water environment from achievement status of EQSWP, and there are still such issues as oxygen-deficient water mass and decrease in seaweed bed and tidal flat. In this regard, The Central Environment Council has decided that the bottom dissolved oxygen as a new living environment item of EQSWP and coastal transparency as a regional goal. The details of these new indexes are described.

Introduction to Environmental Law: "Water Pollution Control Law" and "Waste Management and Public Cleaning Law" — Ror Preventing Violation of the Laws —

Yoshihiro Kemmoku
Kemmoku Ecosupport

In this paper two Environmental Laws were briefly described.

1. Water Pollution Control Law

Factories and establishments(businesses) are required to submit a report when they intend to install a Specified Facility. Businesses shall carefully measure the pollution level of the effluents and identify the state of the discharging areas, for example, the quantity of the effluents such as harmful substances and other pollution indicators including BOD/COD. The legal effluent standards shall be obeyed by proper waste water treatment. However there are still violations including forgery of measured date and erroneous notification.

The businesses shall submit a report when they intend to install a facility using or storing harmful substances and they must prevent groundwater pollution. Further they are required to periodically check the floor, piping, waterways of the facility, in order to prevent groundwater pollution. We must recognize that the clean-up measures to improve the quality of the groundwater takes very long time.

2. Waste Management and Public Cleaning Law

This law regulates waste generators (businesses) through the control of waste management which includes waste sorting, storage, collection, transport, recycling, and disposal. The businesses shall be required to manage of their industrial waste appropriately by themselves even if they are to commission anyone else to transport or dispose etc. of their industrial waste. And they shall endeavor to take the necessary measures and action for proper management of the said industrial waste in the whole process from its generation to final disposal and recycling. For example, followings are some of the effective measures for waste management; to do on-site survey of the contractor's intermediate treatment and final disposal facilities in order to confirm their actual operation(obeying the law or not), and when the issuer (businesses) receives a returned copy of the control manifest from contractors they(businesses) must confirm that the transportation or the disposal has properly completed by confirming the said copy. However there are still many violations of the regulations and illegal waste dumping.

Penalty Arising from the Violation of Waste Management and Public Cleaning Act

－Recent Case Study and Future Amendment of the Act－

Izumi Sato
Attorney at law

Waste Management and Public Cleaning Act was enacted in 1970, which was amended several times in order to prevent illegal dumping and to improve the standard of waste management. Today, a company which violates the act faces severe criminal and administrative penalty. In 2016, a news of food waste scandal was widely spread and the Ministry of Environment warned that the company who generate the waste shall be more responsible to confirm the status of waste disposal. The next amendment of the act is now under discussion.

Local Government-led Renewable Energy of Nakanojo
―Local Production for Local Consumption of Urban Development and the Power of Renewable Energy―

Masao Yamamoto
Nakanojo-Denryoku General Foundation

In Gunma Prefecture Nakanojo, the first time in the country as a local government initiative in August 2013, they founded the corporation " Nakanojo-Denryoku General Foundation" to perform a power producer and supplier. "Nakanojo-Denryoku", purchase power from the three places of the solar power plant Nakanojo to management, such as office and school, is supplied to the town of public facilities. In addition, to start the sales of power to the town of households from July. These, as a resource for renewable energy in the region of Nakanojo, raised the power from there, doing the embodying efforts to "local production for local consumption of power" continue to supply the region.

Basics of Ozone Bleaching
Part１：Properties of Ozone and Bleaching Conditions

Takanori Miyanishi, JAPAN TAPPI

Ozone bleaching began on an industrial scale in 1992 in connection with increasing environmental pressure and customers' demand for Elemental Chlorine Free (ECF) and Total

Chlorine Free (TCF) bleached pulps. Ozone bleaching did not immediately reach its optimal efficiency from a technical viewpoint, but had to face several issues during its early years. By improving mixing technology, better understanding ozone chemistry on pulp components and tuning the whole process, ozone bleaching sequences made it possible to produce a pulp quality similar to or better than conventional ECF would do. They mark a clear milestone in the development of environmentally sound bleaching methods. Today the choice of ozone may still be motivated by ecological requirements but it is mostly justified by the economical savings resulting from chemical cost reduction. They allow combining high brightness and strength with cost efficiency. Ozone bleaching is conducted either at medium or high pulp consistency, depending on ozone bleaching process suppliers. The choice of one process over another depends on a number of factors-including investment costs, carry-over load, bleaching filtrates recirculation and bleach plant temperature profile and others.

－Peer Reviewed－

Evaluation of Salt Tolerance in Candidate Elite *Eucalyptus globulus* Conal Plants and Field Test

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Twenty three elite tree candidates that had been selected for their superior growth rate (1.5 times or more greater timber volume relative to maximum girth of tree) 5 years after being planted in a *Eucalyptus globulus* afforested area in Western Australia were cloned using a tissue culture technique. Three trees (Clone A-C) were then selected for shoot proliferation and high rooting ability. To examine their salinity tolerance, 8-month-old cloned seedlings were then treated with a 100 mM saline solution or.water for 4 weeks. A comparison of the growth rate of the cloned seedlings indicated that Clone A grew the most with the saline-treatment. Based on the measurement results of chlorophyll fluorescence and stem water potential, it is conceivable that the tolerance mechanism was involved in response to water stress. Next, field tests were conducted by planting the 3 elite tree clone seedlings and commercial seedlings. In comparing timber volumes with trees grown from commercial seedlings at 8.5 years of age, Clone A was found to be 1.64 times larger, while Clones B and C were approximately the same. Based on the fact that saline water existed at the test site, it was inferred that there was a connection between the salinity tolerance mechanism that was recognized in the cloned seedlings and the high

growth rate.