JAPAN TAPPI JOURNAL 12
December 2021
Vol. 75, No. 12

CONTENTS

Environment

Topics & Information

Introduction of Research Laboratories (142)

2021 December JAPAN TAPPI JOURNAL
Vol.75, No.12 Abstracts

From paper manufacturing process to wastewater treatment process Kurita's comprehensive method of reducing environmental load

Chise Fukuda
Kurita Water Industries, Ltd.

In recent years, the environment surrounding the paper industry has been changing day by day due to changes in water quality and operating conditions. Above all, fluctuations in the raw materials for used paper are expected to affect the environmental load of the entire factory from the manufacturing process to the wastewater treatment process. In other words, in order to solve the environmental load issue, it is necessary to take a comprehensive approach that captures changes in the water quality of the entire factory. From the perspective of improving productivity and reducing the environmental load, we are focusing on "water", which is often used in the paper manufacturing process.

This report first describes the challenges posed by changes in the raw materials used. Next, as a method of solving the environmental load problem, the first is an effective microbial control method combining an slime control agent and aeration, and the second is the application of an optimum flocculant and coagulant suitable for water quality. Third, we will introduce a water quality management method using S.sensing® that responds to changes in water quality and operations.

Precautions for outsourcing waste treatment in COVID-19 infection

Hironao Sakamoto
ENVIPRO HOLDINGS Inc.

The processor is in an environment where improper processing is likely to occur, and in the past there have been cases of "cross-flow" by the processor.

Against the background of the case where food waste commissioned by food manufacturers was sold as food by an industrial waste disposal company in Aichi Prefecture, penalties for false statements in the manifest were strengthened.

The main problems of the case are: (1) Since the industrial waste treatment flow is unclear, the discharger and the administrative agency cannot notice the reason for violating the Waste Disposal Law such as the forged description of the electronic manifest. , (2) Insufficient information on industrial waste treatment companies makes it difficult for waste generators to identify good industrial waste treatment companies , (3) Improvement of treatment companies after revocation of permission It is not subject to orders, etc.

Violations that are likely to be made by disposal companies include permission of waste type, who is the discharger, whether they are processing, linking after the secondary contractor, and returning the manifest.

As a measure to minimize the risk of improper processing by the processor in COVID-19 infection, it explains the points to note when using the preliminary survey sheet and performing remote audits.

Fundamentals Knowledge and Visualization of Noise -Visualization with acoustic camera and simulation-

Takeshi Hirata
Nihon Onkyo Engineering Co.,Ltd.
Noise Improvement Div.

There has always been a noise problem for the outside and in recent years there has been a growing concern about the noise of working environments. The fundamentals of acoustics in solving the problem can provide some pathway to countermeasures. Moreover, by visualizing sounds that can only be judged by the ears, it is possible to share information about noise problems. In this paper, we introduce the visualization method and the simulation flow.

Ammonia co-firing in coal-fired power

Tadashi Sumida
MITSUBISHI HEAVY INDUSTRIES, Ltd.

For realization of low-carbon society, coal-fired power plant transformation can be categorized into 3 categories, i.e., “Modification to apply lower carbon technology”, “Modification to increase flexibility” and "Scrap and Build to IGCC or GTCC".

The expansion of ammonia utilization promotes the popularization of the hydrogen energy in Japan, and the ammonia is also being studied as a CO2 free fuel.
Merits of ammonia utilization are high hydrogen content, comparatively easy liquefaction (suitable for transportation) unlike hydrogen, utilization of existing infrastructure technology of production, transportation and storage, direct combustion or hydrogenation, and utilization for boiler, gas turbine, fuel, etc.

Challenges are as follows: (1) establishment of safety of ammonia facilities (improvement of laws and regulations), (2) current manufacturing method for reforming and synthesizing natural gas, which is not CO2-free, (3) relatively more expensive than fossil fuel, (4) current condition of, utilization as fertilizer is main, and trade volume is small.

Combustion speed of ammonia is almost equal to coal (pulverized coal), and modification of the heat transfer area is not required by the ammonia co-firing. Only the burner modification is required for ammonia co-firing of the boiler. On NOx control for ammonia co-firing, we can present optimum economical plan by retention time security of denitration in the furnace and strengthening of SCR.

We will promote decarbonization of energy by focusing on the expansion and diffusion of high-efficiency, environmentally friendly power generation systems.

CCUS Initiatives and future policy direction

Kotaro Hirano
Former Ministry of Economy, Trade and Industry
Global Environmental Affairs Office
Assistant to the director

Climate change since Prime Minister Suga's statement in October last year, "Aiming for carbon neutrality in 2050," and "Aiming to reduce greenhouse gases by 46% in 2030 compared to 2013," at the Climate Change Summit in April this year. There is growing interest both inside and outside the country on "CCUS" as a countermeasure technology.

In November 2019, Japan achieved a cumulative CO2 injection amount of 300,000 tons at the Tomakomai CCS Demonstration Center, and demonstrated a consistent CCS system from CO2 separation / recovery to storage / injection. The injected CO2 is continuously monitored based on the Ocean Pollution Control Law, and no signs of CO2 leakage to the ocean have been observed so far.

Regarding CCS, in the "Long-term strategy as a growth strategy based on the Paris Agreement" decided by the Cabinet in June 2019, "We will consider introducing CCS by 2030 on the premise of commercialization." Based on the provisions of this "long-term strategy" and the issues obtained from the CCS verification test at Tomakomai, the Ministry of Economy, Trade and Industry's Global Environmental Measures Office has (1) CCS cost reduction and (2) CO2 transportation means for commercialization of CCS in 2030. We are working on various policies such as establishment, (3) making a base by combining CCS and carbon recycling, (4) securing suitable storage land, and (5) improving the business environment for the introduction of CCS.

In this lecture, we will report on the results of the CCS large-scale demonstration test in Tomakomai and the direction of policy development regarding CCUS. We hope that it will help the pulp and paper industry when considering climate change countermeasures.

Internal and external situations surrounding the global warming issues and challenges for Japan

Jun Arima
The 21st Century Public Policy Institute.
Associate Director for Research

Despite strong push from the US and the EU, emerging countries such as China, India and Russia are opposed to the global carbon-neutrality in 2050 for achieving the goal of limiting the global average temperature rise to 1.5 degrees Celsius since the industrial revolution, and the phase-out of coal-fired power by 2030. This is reflected in a divergence in the messages of G7 and G20. The priorities on climate actions in the 17 SDGs vary from country to country.

China is shrewdly capitalizing on the global trends towards carbon neutrality. While announcing carbon neutrality in 2060, it is expanding the market for PV panels, batteries, wind turbines, and electric vehicles. It is benefiting from retreat of developed countries from fossil fuel sectors and clean coal technology exports.

Under that situation, Prime Minister Suga announced 2050 carbon neutrality goal last October and substantially raised Japan's NDC in 2030 compared with 2013 level from 26% reduction to 46% reduction. He argued that Japan should pursue a virtuous cycle of economy and environment and METI published the Green Growth Strategy specifying 14 industries and technology areas which could contribute to Japan's green growth and therefore should receive policy resources in a prioritized manner. However, we should also face the reality that decarbonization is not cost free and there could be a trade-off between economic growth and environmental protection. It is particularly so in Japan where energy cost is the highest among major countries.

Japan's 46% target was set back-casting from 2050 carbon neutrality goal without thorough examination of its feasibility and economic cost. In its pursuit of 46% target, the government should regularly monitor energy cost and compare it with major trading partners.

Given the bulk of incremental CO2 emissions will come from developing countries in the Asian region, Japanese government and industries develop innovative technologies such as fuel ammonia, hydrogen, CCUS and carbon recycling which are crucial for decarbonization of the region and disseminate them by improving their cost competitiveness. This is the most fundamental contribution of Japan to the prevention of global warming.

Towards 2030
-Study Results of the Working Group on SDGs-

Akihiro Aikawa
General Affairs & Public Relations Division, Japan Paper Association

Paper industry's initiatives are highly aligned with Sustainable Development Goals (SDGs) as forest resources are the core of the business. Thus, Japan Paper Association set up a working group to improve the industry's presence on SDGs. The Working Group extracted 13 materiality of paper industry with related SDGs by the survey to the member companies, then identified eight SDGs to which the industry is contributing, four SDGs the industry can contribute further and two challenges the industry needs to address to make further contribution to SDGs, through SDGs mapping per each materiality. The Working Group also showed the action policies and the strategic initiatives to address the challenges.

Revolutions in the history of civilization induced by paper
Part 11: Innovations and revolutions in Europe induced by paper

Kiyoaki Iida

In the 14th century, Europe started to manufacture paper, and in almost the same time, its society began to change dynamically.

In the Renaissance which was initiated in Italy in the 14th century, huge volumes of books were translated and studied. The movement asked a large volume of paper which the Italian paper manufacturers supplied, improving its productivity and quality.

The Italian technology was transferred to the Protestant in the northern France, which became the largest paper supplier in Europe. The thought of believing in one's reason that had come up in the Renaissance led to the Reformation (1517). New ideas were printed and published in large numbers, and the Reformation was called as a new media revolution. Paper manufactured in France supported the movement. The French technology, then, spread in Europe, due to the abolition of the Edict of Nantes

The Age of Enlightenment followed, that started in the middle of the 17th century. France was the center of the movement, and books became quite common in daily life. Dutch which succeeded in cost-down by inventing Hollander beater became the largest supplier in Europe, being in replace to France.

The intellectual activities that paper had helped to grow yielded the Industrial Revolution (1760-1840) in Britain. Technologies were generalized and information was effectively exchanged.by abundant supply of paper that British paper industry afforded, which had grown to be a leading producer in Europe.

The rise of paper making in some district seemed to be well related to the economic growth and resulting social revolution in that district. The simple work of paper making was a significant presence in a big wave of social developments.

An Essay on Methodology for Innovating *"JAPAN TAPPI JOURNAL"*
Part 17: On the Ethics as related to the Freedom of Editing Journals

Fumihiko Onabe
Professor Emeritus,The University of Tokyo(Paper Science)

Human beings have free wills. However, human actions and behaviors without codes of conducts will lead to instability, confusion and anarchy of the organization and society.

The seventeenth article of this series will analyze the journals in terms of "ethics as constraining codes" in editing journals. The overall contents are described as below.

1. Introduction
2. The meaning of ethics
3. Codes of ethics as human conduct codes
4. Codes of ethics as constraining conditions of human behaviors
5. Publication ethics
6. Journal's ethics
7. General ethics codes of academic journals
8. Corporate or business ethics
9. Ethics required for the *"JAPAN TAPPI JOURNAL"*
10. Epilogue

The Oldest Extant Paper in Japan and the Oldest Extant Paper Written in Japan

Naohiko Tsujimoto

The "oldest paper" that exists in Japan, that is, the " Li Bai Document (Draft of a letter by Li Bai)" written in China in 328, and the "oldest paper written in Japan (615)", that is, Prince Shotoku's autograph "Hokke gisho (Commentary on The Lotus Sutra)", those two cultural heritages are explained in this paper.

The raw material of the paper of "Li Bai Document" is apparent, because a part of linen cloth can be seen on the paper. On the other hand, the content of the document was extremely difficult to decipher, but at the end of the Meiji era, a Japanese researcher succeeded in the identification of Li Bai and also the deciphering the content, and the value of the " Li Bai Document" became known to the world.

Regarding "Hokke gisho", it was reported by Nara National Museum in 1921 that the paper was dyed yellow. Until recently, the opinion that "Hokke gisho" was not written by Prince Shotoku was supported by the academic circles of Japanese History. In this article, it is explained in six items that "Hokke gisho" was written by Prince Shotoku, and one of the items is a research result by using a search system that digitizes almost all Buddhist texts (about 100 volumes). I will clarify the validity that "Hokke gisho" was written by Prince Shotoku.