



News Releases

November 20, 2024

Nippon Soda Co., Ltd. and Kyulux Inc., sign capital and business alliance agreement to establish mass production system for OLED light-emitting materials



NIPPON SODA



Nippon Soda Company, Limited. (Head Office: Chiyoda-ku, Tokyo; President: Eiji Aga; hereinafter “Nippon Soda”) and Kyulux, Inc., (Head Office: Fukuoka City, Fukuoka; President: Nobuyuki Nakano; hereinafter “Kyulux”) have signed a capital and business alliance agreement to establish a mass production system for Thermally Activated Delayed Fluorescent materials (hereinafter “TADF”), a next-generation organic electroluminescent displays emitting material platform.

Going forward, Nippon Soda will take an equity stake in Kyulux and will engage in process development and capital investment toward establishing a mass production system. Kyulux will then provide technical support to Nippon Soda in building its mass production system, thereby realizing the world's first mass production and stable supply system for TADF.

Background of the partnership

Kyulux is a startup company from Kyushu University that develops next-generation OLED materials for use in OLED displays. The market for OLED displays is growing rapidly as an alternative to LCDs, and there is a demand for even higher performance and lower power consumption in the future. TADF*¹, developed by the company, is a new material that does not use any rare metals and reduces the environmental impact. Hyperfluorescence™*², an OLED light emitting technology that uses TADF as an assistant dopant*³, is expected to become a leading OLED material technology as it simultaneously achieves high color purity, low power consumption, long lifetime and low cost.

The two companies signed a joint development agreement in January 2020 and have been working on research and development of intermediates with the goal of establishing TADF production know-how. However, in anticipation of the start of mass production in the future, further collaboration has become necessary, leading to the conclusion of a capital and business alliance agreement in October 2024. Through this partnership, the two companies aim to build a high-quality and stable TADF supply chain and further improve performance and strengthen sales.

Nippon Soda's long-term vision, " Brilliant Through Chemistry 2030," and its medium-term management plan,

" Brilliant Through Chemistry Stage II" aims to develop new products and enter new businesses by enhancing their core technologies through the synergy of deepening and fusing its own technologies and introducing external technologies. This partnership will serve as a foothold for entering the new business field of OLED displays and will contribute to further enhancing the corporate value of the Nippon Soda Group as a result of the open innovative efforts the company has been pursuing.

* **Assistant dopant:** A material added to make OLED materials emit light. Here, TADF, which is used together with fluorescent molecules when emitting light in Hyperfluorescence™ technology, is called the assist dopant.





NIPPON SODA CO.,LTD.


About TADF:

TADF (Thermally activated delayed fluorescence) is a third-generation OLED emitter material that achieves high efficiency with the help of thermal energy which is emitted by OLED molecules with the help of thermal energy. TADF has extremely high internal quantum efficiency and does not require rare metals, which are currently essential in OLED material technology, making it a trump card for reducing costs and increasing efficiency. TADF was developed in 2012 by Professor Chihaya Adachi of Kyushu University and his research center, the Center for Organic Photonics and Electronics Research (OPERA), and in recent years, extensive research activities have been conducted by scholars and companies around the world.

About Hyperfluorescence™:

A fourth-generation OLED technology that combines TADF with fluorescent materials to transfer energy from TADF to fluorescent molecules to emit light. It is the ultimate emission mechanism that can achieve high efficiency, long life, rare metal-free, and high color purity emission.

Game Changer of OLED Display				
	Efficiency		Cost	Color Purity
	IQE	Brightness: TE		
 Fluorescence	25%	1	Low	High
 Phosphorescence	100%	x 2	High Rare Metal required	Low

 Hyperfluorescence™	100%	x 4	Low	High
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IQE: Internal Quantum Efficiency TE: Top Emission

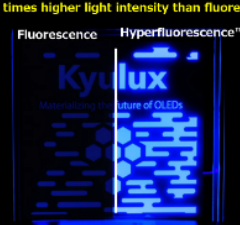
Competitive Advantage of Kyulux

The company owns the fundamental patent of Hyperfluorescence™

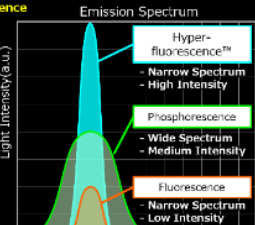
- Hyperfluorescence™ is the ultimate display technology
 - High efficiency, high color purity and rare metal free material
- Kyulux, the indispensable company for the 4th generation OLED displays

Features of Hyperfluorescence™

Four times higher light intensity than fluorescence



Fluorescence Hyperfluorescence™



Emission Spectrum

- Ultra Narrow Spectrum enables high color purity**
 - Full width half maximum: FWHM < 20 nm
- High light intensity**
 - Four (4) times higher than Fluorescence
 - Two (2) times higher than Phosphorescence and TADF
- Top emission device achieves UHDTV (BT.2020) requirements**

Eiji Aga, President and Representative Director, Nippon Soda Co., Ltd. Commented:

“Nippon Soda Group's long-term vision, "Brilliant Through Chemistry 2030” identifies the ICT field as one of the key fields that will contribute to the development of a sustainable society and improve corporate value.

Kyulux's OLED light-emitting technology is innovative, achieving high efficiency and high color purity at low cost, and we will work with Kyulux to build a mass production system for TADF, utilizing our synthesis know how cultivated over many years.”

Nobuyuki Nakano, President and Representative Director of Kyulux Corporation Commented:

“Since its establishment in 2015, Kyulux has been developing next-generation OLED materials. With commercialization imminently, there is a strong demand for the establishment of a mass production and quality assurance system for high-quality, low-cost OLED materials. We are truly grateful to have found Nippon Soda, the best business partner who can help us meet this demand. We are confident that this partnership will be a major step in our full-scale entry into the OLED industry.”

Tatsuro Ishibashi, President of Kyushu University Commented:

“Kyushu University has set social co-creation as one of the pillars of VISION2030 and is working to quickly uncover original research results that lead to innovation, collaboration with society, and expand the creation of intellectual property and startups, thereby carrying out various initiatives for social change from Fukuoka and Kyushu to Asia and the world.

Kyulux is a front-runner in the social implementation of our university's research results, and since its founding, as a shareholder, our university has continuously supported the company by transferring major intellectual property, including the basic patents for TADF/Hyperfluorescence™, and transferring research results through joint research.

This partnership between Kyulux and Nippon Soda is aimed at building a mass production system, which is the final stage of social implementation, and we are very pleased with this symbolic example of the realization of our vision.”

Prof. Chihaya Adachi, Scientific Advisor at Kyulux, Inc., a Distinguished Professor at the Department of Applied Chemistry at Kyushu University and the Director of the Center for Organic Photonics and Electronics Research (OPERA), commented:

“At our university, we aim to turn zero into one and produce original, groundbreaking research results, and TADF/Hyperfluorescence™ is a groundbreaking research result that turns zero into one. Since inventing TADF in 2009 and developing Hyperfluorescence™ in 2013, the two have been positioned as the ultimate next-generation OLED technologies, and even greater developments are expected in the future. This partnership with Nippon Soda will lead to mass production of *TADF/Hyperfluorescence-OLED*, and as a co-founder of Kyulux, I am truly pleased that this is the realization of a long-held dream of mine.”

About Nippon Soda.

Since its founding in 1920, Nippon Soda has accumulated unique technology and know-how to provide highly functional, high-added-value chemical products, including agrochemicals, pharmaceuticals, and specialty chemicals. As a company that handles chemical substances, we have always been conscious of the concept of responsible care and have conducted business activities that take into consideration the environment, safety, quality, and health. We will continue to create new value through our original technologies and products and contribute to creating a prosperous society.

For more information, please visit <https://www.nippon-soda.co.jp/>.

About Kyulux.

Founded in 2015, Kyulux is dedicated to the development of next-generation materials for OLED displays and lighting. Based on technology licensed from Kyushu University and Harvard University, Kyulux is developing TADF/Hyperfluorescence™ light-emitting technology that delivers cost-effective, long-lasting, high-color purity, and highly efficient light emission all without relying on rare metals.

For more information, please visit www.kyulux.com

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**NIPPON SODA CO.,LTD.**