Noctiluca's new proprietary material shows excellent test results

Warsaw, Poland, April 14th, 2025 – Noctiluca, technology company listed on the Warsaw Stocke Exchange, has developed a breakthrough material for use on one of the OLED display layers. In laboratory tests in Korea, NCEIL-4 demonstrated a 15-fold increase in blue pixel lifespan while reducing power consumption. *"This could be an important step forward in the ongoing race for blue in the OLED market,"* says Mariusz Bosiak, the coomany's CEO.

Race for blue

Noctiluca is a deep-tech company in the material sciences, developing high-performance materials (HPM) that enhance the functionality of OLED devices and other products from the broader field of organic electronics.

Leading market players, including Noctiluca, are particularly focused on developing the most desirable blue light emitter, as the vast majority of light emitted by displays is in this color. These materials are important components of OLED displays, determining attributes like image quality, color saturation, brightness, and durability.

Despite extensive research efforts, no company has yet succeeded in completing a fully optimized blue emitter. As a result, first-generation blue emitters—an inefficient technology from the 1990s—are still widely used today.

NCEIL-4: potential beyond the OLED market

"With the race for a blue emitter still ongoing, our team asked ourselves if there was another way to improve the OLED stack and extend the overall lifetime of blue pixels. We focused on market needs and the pain points of our clients. Through targeted research and collaboration with OLED manufacturers under the chemical CRO/CDMO model, we developed a new electron injection material (EIL) called NCEIL-4," explains Mariusz Bosiak, CEO of Noctiluca.

In comparison to the widely used material Liq (8-Quinolinolato lithium), Noctiluca's research shows that NCEIL-4 delivers substantial improvements in blue OLED performance. Using NCEIL-4 as the electron injection layer (EIL) extends device lifetimes by five times, while doping the electron transport layer (ETL) increases longevity by 15 times—a significant leap in durability.

This material also enhances external quantum efficiency (EQE) and current efficiency, reduces driving voltage while maintaining low turn-on voltage, and lowers the charge injection barrier—resulting in lower energy consumption. What makes this advancement particularly important is that, despite these improvements in efficiency

and longevity, the spectral characteristics of the devices remain unaffected, making NCEIL-4 a promising solution for next-generation OLED applications.

NCEIL-4, due to its similarity to compounds like Liq and LiF, has potential applications as a replacement in OLED stacks using Noctiluca's materials from the NCEIL series. It can be utilized in OLEDs through both PVD and InkJet printing methods. Additionally, it can be used in organic photovoltaic cells (OPV) to reduce energy losses and improve electron transport, as well as in organic field-effect transistors (OFET) to enhance performance and switching characteristics.

Business perspective

Noctiluca currently collaborates with or has established relationships with eight of the top ten global display manufacturers, as well as several smaller producers. The company is also exploring alternative OLED applications, engaging with clients in sectors such as lighting, document securitization, gaming hardware production, and packaging printing.

"In recent years, we have transitioned from a tech company focused solely on developing proprietary OLED emitters to one that develops and manufactures advanced chemical compounds an industrial scale for products of the future," says Bosiak.

Looking ahead, Noctiluca aims to become a leading hub for OLED technology in Poland and Europe. Its strategy involves consolidating Polish and European research efforts in chemical materials for OLEDs and expanding engineering and device physics capabilities in Poland, with an investment of $2–3 million beginning in 2025.

In December 2024, Noctiluca made its debut on the Main Market of the Warsaw Stock Exchange (GPW), marking a significant milestone in the company's growth.

About Noctiluca

Noctiluca – a technology company from Toruń, Poland, listed on the Warsaw Stock Exchange. It specializes in developing proprietary, advanced chemical compounds in the field of organic electronics, used by, among others, OLED manufacturers. Noctiluca develops and produces new-generation OLED emitters. These are key components of displays (monitors, TVs, smartphones, wearable devices, and VR) as well as light sources (e.g., lighting).

In recent years, the company has achieved rapid technological advancement. It has a state-of-the-art laboratory in Toruń and its own R&D department in South Korea, has strengthened cooperation with leading research institutes in Germany, and has initiated a project with ITRI, the leading high-tech and industrial development agency in Taiwan.

In terms of commercial potential development, the company has relationships or contracts with, among others, 8 of the 10 largest display manufacturers in the world, the largest global watch manufacturer from Switzerland, the largest global telecommunications equipment manufacturer from China, and the largest global consumer electronics manufacturer from the USA.

More at www.noctiluca.eu