

**Joint Research with Tohoku University Yields New Technology  
For Producing Aluminum Nitride Single Crystals**

~ Breakthrough Will Accelerate Development of Deep UV LEDs ~

Sumitomo Metal Mining Co., Ltd. (SMM) has succeeded, in collaboration with a research group headed by Professor Hiroyuki Fukuyama of the Institute of Multidisciplinary Research for Advanced Materials of Tohoku University, in developing technology to produce aluminum nitride (AlN) single-crystal film on sapphire nitride substrates. Tohoku University is a national university located in Sendai, Miyagi Prefecture.

The single-crystal growth method developed through this joint research is liquid-phase growth technology employing newly developed gallium aluminum (Ga-Al) flux. The new method enables high-speed growth of high-quality crystals under normal pressure and at low growth temperature, i.e. without the high pressure and high temperature required with conventional methods. This R&D breakthrough is expected to speed the realization of highly efficient deep UV LEDs.

UV LEDs are next-generation light sources projected to be adopted in a multitude of industrial applications. These include not only next-generation lighting such as white LEDs but also photocatalyst excitation light sources (used to decontaminate, antibacterialize or prevent contamination of water, soil and air), fluorescent light sources in biomedical fields (for use in differentiating tumor cells using special pigments, sterilization, etc.), processing of high-density DVD lasers and precision lasers, lithography, etc. Deep UV LEDs, which are especially effective as sterilizers, are eagerly expected to bring benefits to biomedical applications.

SMM is actively engaged in business operations involving single crystals for LEDs: gallium phosphide (GaP) single crystals, etc. Applying the newly developed technology, the company now looks to add new products to its portfolio.

The content of this research will be announced at the 71st Fall Meeting of the Japan Society of Applied Physics (JASP) in Nagasaki (September 14-17) and the International Workshop on Nitride Semiconductors (IWN 2010) in Tampa, Florida (September 19-24).

SMM has been undertaking comprehensive joint R&D with Tohoku University's Institute of Multidisciplinary Research for Advanced Materials since 2003. In June 2010, the company and the university concluded a cooperative agreement aimed at developing this program further and strengthening their collaborative ties. The new technology represents a tangible product of this comprehensive joint R&D initiative and the liaison agreement. Going forward, based on the cooperative agreement SMM intends to promote joint research with Tohoku University ever more vigorously.

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