# A Novel Method for Fixing the Anisotropic Orientation of Dispersed Organic Nanocrystals in a Magnetic Field

**Satoru Shimada**
**Tatsumi Kimura**
Photonics Research Institute

E-mail:
satoru-shimada@aist.go.jp

AIST Today Vol. 5,No.4 (2005)
p.12-15

The immobilization of the trans-4-[4-(dimethylamino)]stilbazolium p-toluenesulfonate (DAST) nanocrystals in a dispersion, which were oriented in magnetic fields, was studied. The odorless, transparent, and rubber-like solid was obtained by photocuring of the dispersion in lauryl acrylate. The relaxation of the oriented nanocrystals was not observed at 100 °C for 24 hours. Maximum contrast of the absorbance through a parallel and perpendicular polarized light was approximately 0.43 at 555 nm.

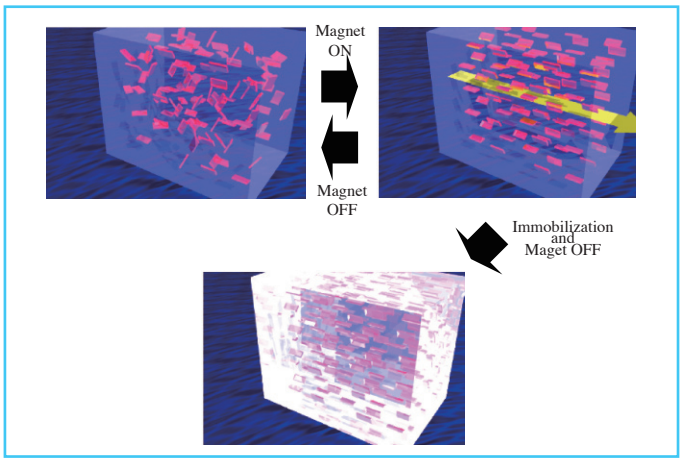


Figure: The picture shows the free-sized lauryl acrylate polymer vials including the anisotropically oriented DAST nanocrystals by applying a magnetic field and a quarter.



# New Cleanup Technology for Diesel Exhaust by Using Electrochemical Ceramic Reactor

**Yoshinobu Fujishiro**
Advanced Manufacturing
Research Institute

E-mail:
y-fujishiro@aist.go.jp

AIST Today Vol.5, No.5 (2005)
p.10-13

New electrochemical reactor has been developed,which makes it possible to oxidize particulate matter (PM) or solid carbon-based emission, and simultaneously to clean up nitrogen oxide (NOx), through the redox reactions in an electrochemical ceramic reactor. In contrast to the conventional PM filter system, the electrochemical ceramic reactor can decompose PM continuously by using active oxygen generated from a ceramic electrode mixed with calcium aluminate ($Ca_{12}A_{l14}O_{33}$) without requiring regeneration. The new reactor is expected to serve as new technology for zero-emission exhaust gas cleanup in the treatment of diesel exhaust gas.

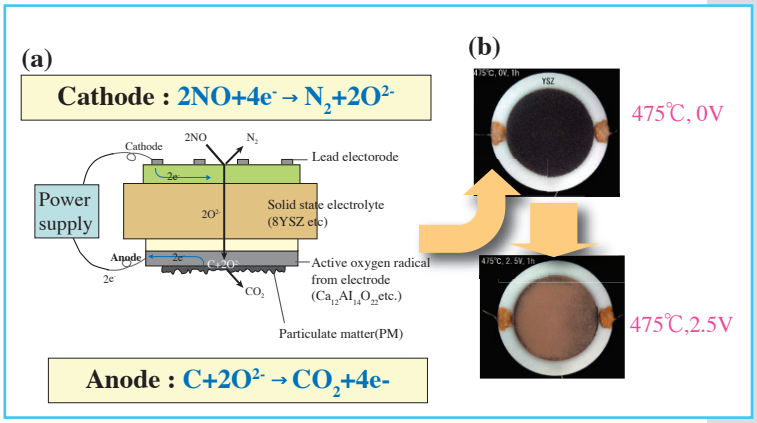


Figure: (a) Principle diagram and (b) photographs of electrochemical PM elimination with a ceramic reactor.