# Construction of a Deep Ultraviolet Raman Microprobe System

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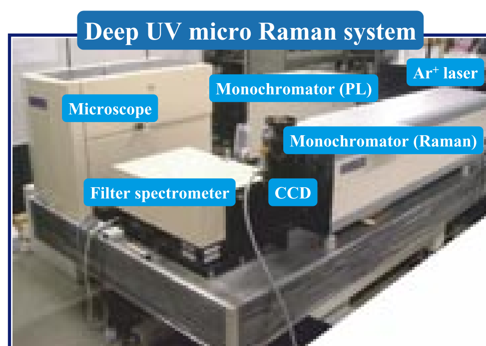
A Raman microscope system using deep UV(DUV) laser excitation has been developed to characterize nano- scaled surface layer of wide gap semiconductors.

This system consists of DUV laser operating at 244 nm, microscope, dispersive spectrometer combined with a filter spectrometer and a CCD detector.

We have constructed this high through-put system using highly reflective dielectric mirrors instead of metal mirrors, and a Cassegrain reflection type objective. This DUV Raman system has enabled us to examine nano-scaled epitaxial films of wide gap semiconductors such as SiC and AlGaN. We have characterized ion-implanted surface layer and polished surface layer of SiC. We expect that our DUV Raman systems will be a versatile tool for characterizing thin surface layers of wide gap semiconductors.




Photograph of developed DUV microscope

# Eye-Detection of ppb Level Pb(II) by the Ce(IV) Phosphate Membrane Filter Coupled with Color Signaling

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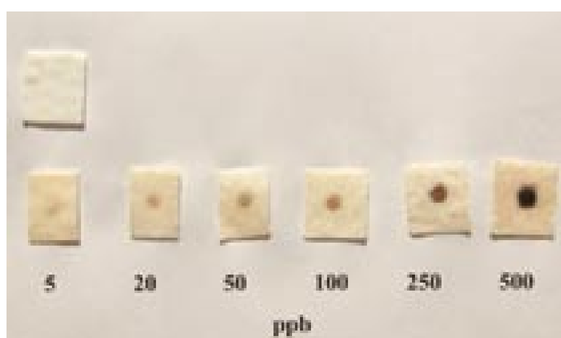
Lead is harmful heavy metal giving fatal damages to brain and nerve, and therefore, strict allowance standard has been adopted to industrial waste water(100 ppb), and to environmental and drink waters (10 ppb). A Pb(II) selective membrane filter was fabricated from the fibrous $Ce(HPO_4)_2$ $H_2O$ (Cerium phosphate) crystal. Trace Pb(II) of ppb level was selectively captured on the membrane surface simply by filter the sample solution. Visual detection of ppb level of Pb(II) was realized by coupled with color development as PbS. The simple detecting technique can provide an on-site and low cost means of monitoring trace lead ion in environmental water and industrial waste water.




Detection of ppb level of Pb(II) by color development on the cerium phosphate membrane filter