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## Study of Scintillation in Helium Mixed with Xenon to Develop Thermal Neutron Detectors

A position sensitive He-3 proportional counter has been used in experiments of neutron diffraction and so on. However, the detector is not applied to use in high counting neutron fields because the time resolution of the detector is in order of several microseconds. One of the efficient solutions to this problem is a use of scintillation in helium. However, scintillation photons in He<sup>2+</sup> lie in VUV region and He<sup>2+</sup> has a long decay time. In order to solve these problems, we have been studying to exchange a luminescence origin from helium to xenon by adding a small amount of xenon to helium. A purpose of this study is to understand scintillation property in helium mixed with xenon, such as luminescence spectra, time profile and scintillation yield, and is to develop a 2-dimension position sensitive thermal neutron detector using He/Xe mixture. In order to understand the basic property of scintillation in He/Xe mixture He-4 gas was used. We found that the luminescence spectra of scintillation in He/Xe mixture shifted to the wavelength region of 150-200nm. The scintillation intensities were measured using a PMT sensitive to photons with wavelength of 115-300nm. In the case that the partial pressure of xenon was 0.01 MPa in He/Xe mixture at 1.0 MPa, the scintillation yield was almost equal to that in pure xenon of 0.1 MPa.

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