

**Purpose:**

During the past several years there has been used of SPECT for optimizing the diagnostic capabilities by single photon imaging. SPECT produces computer-reconstructed gamma-ray images by up-taken radiotracer. The existing clinical SPECT have two scintillation NaI(Tl) detectors, positioned at  $90^\circ$  to  $180^\circ$ . The purpose of this study is to test the feasibility of SPECT system consisted of fabricated CsI(Tl)-PIN photodiode detectors with circular geometry like PET and CT geometry for multi-modality applications.

**Methods:**

The sensors are fabricated with CsI(Tl) scintillator which is matched with PIN photodiode. And The single CsI(Tl)-PIN photodiode detector are housed with a preamplifier and a shaping amplifier. Each detector's energy spectrum was measured by standard NIM module system. The detectors of SPECT system were positioned at angular interval of  $18^\circ$  in circular geometry. The imaging data of  $^{137}\text{Cs}$  source was obtained by an SCA(single channel analyzer) and a counter system.

**Results:**

The average energy resolution of detectors was 11.16 % at 662 keV from  $^{137}\text{Cs}$  gamma-ray source. The feasibility test of SPECT system for image was performed at five positions included center position of system.

**Conclusions:**

In this study, CsI(Tl)-PIN photodiode detectors' energy spectrum were measured. The feasibility test was performed for SPECT system application. The detectors show appropriate energy resolution for SPECT application. By measuring of gamma-rays at separated positions, we could reconstructed gamma-ray images according to various source locations.