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FEED of ZnO nanostructures

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Field emission energy distribution (FEED) was investigated for ZnO nanostructures which were synthesized by thermal chemical vapor deposition. The energy spectra are found to be different from those for carbon nanotubes which mostly follow metallic behaviors. Distinctive two behaviors can be found in the FEED spectra--one energy peak which does not moves, and two energy peaks which move to lower energies as the applied voltage varies. The position for the non-moving peak is near the Fermi energy, while the moving peaks are located several eV lower than the Fermi energy. The two moving peaks of the FEED, which have almost the same slopes for the applied voltage variation, are considered to be originated from field penetration due to the non-metallic properties of ZnO. The field emission characteristics and scanning electron microscopy pictures for the nanostructures will also be shown in the poster.