Loading of single-walled carbon nanotubes (SWCNTs) is very important for applications. The loading methods include the loading from the gas phase, and the liquid phase – the melt, and the solutions. It was demonstrated that the incorporated substances form the new interesting properties, and phases inside SWCNTs. The spectroscopic techniques, such as Raman spectroscopy, X-ray photoelectron spectroscopy (XPS), optical absorption spectroscopy (OAS), and near edge X-ray absorption fine structure spectroscopy (NEXAFS) were utilized. It was shown that the incorporated substances may cause the p-, and n-dopings of the SWCNTs. I have encapsulated inside the SWCNTs the new compounds, such as iron chloride ($FeCl_2$), cobalt chloride ($CoCl_2$), and bismuth telluride (Bi_2Te_3). The loading was investigated by the high-resolution transmission electron microscopy (HRTEM), and it was proven that the interior space within the SWCNT walls is loaded. The incorporated substances formed the crystalline phases inside the SWCNTs. The spectroscopic investigations showed that iron chloride, and cobalt chloride led to p-dopings of the SWCNTs. This was observed as the shifts, and the changes of shapes of the Raman modes, the shifts of the C 1s XPS in lower binding energies side, the appearance of additional peaks in the C 1s NEXAFS, the disappearance of peaks in the OAS spectra.