This thesis deals with the application of micro-Raman spectroscopy to analysis of artworks. The main topic of the thesis was to qualify, select and eventually optimize methods acceptable to identification of indigo dye in the paint layers of artworks. Selected dye was studied in various states using set of excitation lasers emitting in the visible region. There was also studied the real usage of resonance and surface-enhanced methods. The result of the thesis are the conclusions related with the suitability of particular techniques of Raman spectroscopy to identify the target pigment in the art.