Complexes of cationic porphyrins with nucleic acids are interesting from the point of view of delivery of therapeutic oligonucleotides into cells as well as for photodynamic therapy of cancer. Diploma thesis deals with study of the complexes of cationic metalloporphyrin CuTMPyP4 with poly(dG-dC)2, where intercalation of porphyrin within polynucleotide's base pairs is supposed and with poly(dA-dT)2, poly(dA)·poly(dT), in which external groove-binding of CuTMPyP4 on the helix is assumed. The measurements were made by SERRS, RRS and absorption spectroscopies. From the time evolution of the SERRS spectra for each complex it was found, that intensity of SERRS spectra and rate of SERRS kinetics for complexes fall short of intuitive supposition about low SERRS signal and its slow increasing in the case of intercalation of porphyrin, because for complex of CuTMPyP4 with poly(dG-dC)2, the SERRS kinetic are very fast and final SERRS signal is more intense than for poly(dA-dT)2, poly(dA)·poly(dT). Comparing the SERRS and RRS spectra of the complexes it was found that SERRS spectra correspond to the porphyrin molecules released from the complexes rather that to the entire complexes. Study of various colloidal systems used for SERRS measurements revealed that SERRS signal evolves with time of exposition, namely for colloids with low -potential, which seems to be caused by existence of „hot spots" exhibiting themselves also in macroscopic sample.