Nitroaromatic compounds are mutagenic and carcinogenic substances present in environment. Most of nitroaromatic compounds are potent mutagens in bacterial and mammalian systems. They are also carcinogens causing development of tumors, primarily in the liver, lung and mammary glands.
3-Nitrobenzanthrone (3-NBA, 3-nitro-7H-benz [de] anthracene-7-one) is one of the polycyclic aromatic nitro compounds possesing high toxic effects. 3-NBA is an environmental pollutant present in diesel exhaust and was also detected in soil and in rain water. 2-Nitrobenzanthrone (2-NBA, 2-nitro-7H-benz [de] anthracene-7-one) is an isomer 3-NBA, which also occurs as a pollutant in air. Although the 2-NBA is a weakly toxic substance, its high abundance in air could exhibit a high health risk to humans. This thesis investigates the metabolism of 3-NBA and its isomeric derivate, isomer 2 NBA, under anaerobic and aerobic conditions. To study the metabolism of these compounds, microsomal systems isolated from the liver of rats pretreated with Sudanem I, -naphthoflavone, phenobarbital, ethanol and pregnenolon 16-carbonitrile (PCN), the inducers of cytochromes P450 1A, 2B, 2E1 and 3A, were used. We also used mouse models, a control mouse line (wild type WT) and mice with deleted gene of NADPH:CYP reductase in the liver, thus absenting this enzyme in their livers (HRN). HPLC separation of metabolites formed of 3-NBA (2-NBA) was utilized in a study of 3 NBA and 2-NBA metabolism. We also performed the experiments, in which 3-NBA was activated under anaerobic conditions. The same microsomal systems were used for these experiments. The 32P postlabeling technique, to detect and quantifate DNA adducts generated by 3-NBA, was used. (In Czech)