

Abstract:

Aromatic nitro-compounds are contaminants present in environment. They are produced from gas-phase reaction of their parent compound with oxides of nitrogen. Aromatic nitro-compounds are found in an extract of exhausts from diesel and gasoline engines, in a cigarette smoke and in the soot from burning wood. The most of aromatic nitro-compounds are mutagens in bacterial and mammalian systems and the most of them are carcinogens that are connected with induction of cancer. Primarily lung followed by liver and mammary glands are target organs of their carcinogenic activity. This bachelor thesis describes a metabolisms and carcinogenic activity of several aromatic nitro-compounds: 2-nitroanisole, 4-nitroanisole, 3-nitrobenzathrone, 2-nitrobenzanthrone, 2-nitrotoluene, dinitrotoluenes, 2,4,6-trinitrotoluene.

2-Nitroanisole is used primarily as precursor in the synthesis of *o*-anisidine, an intermediate in the manufacture of many azo dyes and pigments. Both chemicals show strong carcinogenic activity to rats and mice. 4-Nitroanisole is produced by metabolic methylation of 4-nitrophenole that is used for synthesis of dyes and fungicides. 4-Nitrophenole is accumulated in environment. Therefore, it is considered to be an environmental pollutant. 3-Nitrobenzathrone is a strong carcinogen of rodents and causes lung cancer. This carcinogen is found in the exhausts from diesel engines. Mutagenic and genotoxic activity of 3-nitrobenzanthrone is much stronger than its isomer 2-nitrobenzanthrone. 2-Nitrotoluene is used for production of agriculture chemicals and azo dyes. This compound is evaluated to be a rodent carcinogen. Dinitrotoluenes and trinitrotoluenes are members of groups of herbicides and explosives. They are proved to be rodent carcinogens, too.

The reduction of nitro group of these nitro-compounds leads to activation metabolism, leading to formation of precarcinogenic lesions in DNA. Oxidative metabolism of aromatic nitro-compounds is suggested to be, in most cases, their detoxication metabolism.

Key words: Aromatic nitro-compounds, carcinogens, contaminants, metabolisms of aromatic nitro-compounds, 2-nitroanisole, *o*-anisidine, 4-nitroanisole, 4-nitrophenole, nitrobenzanthrones, 3-nitrobenzanthrone, 2-nitrobenzanthrone, nitrotoluenes, dinitrotoluenes, trinitrotoluenes, DNA adducts, ³²P-postlabelling, cancer.