Abstract

The thesis deals with a redevelopment process for aminonitroaromatic pollutants of ground and surface water by a combined microbiological and chemical procedure. The first step involves a reduction of trinitrotoluene (TNT) by the bacterium HB *Raoultella terrigena*. This bacteria strain completely transforms TNT on a time scale of hours into biological metabolites. The major products of this process are the intracellularly remaining azoxy derivatives of TNT and small amounts of aminonitro aromatic products found in the cell culture supernatant. This compounds were identified and quantified by analytical and radiochemical techniques. While the axozy derivates can be disposed together with the cells, a photocatalytic degradation method was selected to completely decompose the aminonitroaromatic substances in the solution. For this reaction we focused on daylight-activated photocatalysts on the basis of titaniumdioxide. To this end, two commercially available carbonmodified TiO_2 formulations were used as well as a sulfurmodified TiO_2 formulation which still is under development. Of particular interest in this respect is the activation of the semiconductor by visible light, as the aminonitroaromatic metabolites are considerable easier to degrade than TNT itself. It could be shown, however, that the efficiency of the catalysts is not yet good enough, so that a mineralization of the metabolites can be achieved in a sufficiently short time with a reasonable input of energy.