

ABSTRACT

Nowadays, one of the most serious environmental problems is the contamination of soil and groundwater. In Europe, 300,000 contaminated or potentially contaminated sites have already been identified and there it is estimated that 1.5 million contaminated sites exist. In the United States of America, more than 63,000 have already been identified. In Brazil, 1,336 contaminated sites have been identified in the State of São Paulo. Of the remediation technologies that can be applied for the recovery of these sites, bioremediation has the advantage of destroying the contaminants, but it is necessary to determine the degree to which they biodegrade in the soil. In Brazil, this data is lacking, since tropical soil has different characteristics than the soil of regions with temperate climates. Bartha's respirometric method, adapted from a Dutch norm, is a simple and economically viable method for determining carbon dioxide generation and, indirectly, the biodegradation of organic contaminants in the soil. In this research, this method's applicability was studied for a typical tropical soil, predominant in the State of São Paulo, using phenantrene as an organic contaminant. Based on the results of this study, it was possible to verify that the carbon dioxide generated resulted not only from the biodegradation of the contaminant, but also from abiotic reactions that occurred in the soil, mainly from the balance of calcium carbonate, added to neutralize the pH. This fact makes the analysis of the results of the respirometric tests more difficult, since the procedure described in Brazilian norm NBR 14283/99 relates the generation of carbon dioxide directly to the biodegradation of the contaminant. Despite this difficulty, it was possible to verify the biodegradation of the phenantrene for indigenous microorganisms. Furthermore, this research verified the difficulty of sterilizing the soil, which would make it difficult to evaluate the removal of contaminants by other mechanisms, such as volatilization and adsorption.