



Emissions of volatile organic compounds from dry leaf litter and their dependence on temperature

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Emissions of several volatile organic compounds (VOCs) from dry leaf litter at temperatures in the range 20 - 100°C are measured for different plant species. The emission rates of ethane, ethene, propane, propene, n-pentane and methyl chloride increase exponentially with temperature and follow the Arrhenius relation. Emission rates up to 650 ng/gdw/hr were measured for hydrocarbons at 70°C, while for methyl chloride emission rates up to 18 µg/gdw/hr were measured at this temperature. Activation energies derived from the Arrhenius plots are generally higher than 50 kJ/mol, which is an indication that the emissions are of abiotic origin. The emission of VOCs from dry leaf litter decreases in time, due to depletion of the precursor reservoirs. At low temperatures (20 - 30°C) the decrease is very slow, but at higher temperatures (80 - 100°C) it is noticeable on a timescale of hours. Our results show that hydrocarbons can be produced in the leaf, but the production requires oxygen. Emissions of methyl chloride from dry leaves can be significant for the global budget of methyl chloride.