

B417**Long-Term Changes of Streamwater Chemistry at a Catchment of the Reinhardswald Forest, Germany**

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During the hydrologic years 1985 through 1991, long-term changes of water chemistry on stream samples collected in intervals of 14 days were investigated at the Elsterbach Catchment of the Reinhardswald in North Hesse, Germany. The regression analysis between concentrations of chemical substances and flow revealed a great effect of hydrology on the chemical water quality. The seasonal Kendall Test with the flow-adjusted residual concentrations of the 7 year series of element concentrations in streamwater showed a declining trend in the sum of anion concentrations of strong acids (SO_4^{2-} , NO_3^- , Cl^-). This was particularly true for sulphate, because of strongly reduced deposition rates. Standing opposite on the side of the cations, there was a significant decrease of the sum of base cations (Na^+ , K^+ , Mg^{2+} , Ca^{2+}) while the sum of acid cations (H^+ , Mn^{2+} , Al^{3+} , Fe^{3+} , NH_4^+) remained statistically unchanged. According to the decline of sulphate, the alkalinity of streamwater increased significantly.

B418**Development of a Respirometer for Continuous Monitoring of Soil Microbial Activity.**

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The continuous monitoring of soil respiration rate can provide valuable information on the variables affecting microbial activities such as substrate decomposition. An apparatus has been built to modify the respirometer described by Nordgren(1988). The principle involved is that CO_2 absorbed in hydroxide solution forms carbonate ions and the conductivity of the solution decreases. The change in conductivity can be calibrated against CO_2 absorption and provide an integrated measure of respiration. The respirometer system is linked to a fully computerized sampling system so that a large number of samples can be monitored hourly during limited periods. The complete system consists of jars placed in a water bath connected with a relay board, that was connected each jar in turn. The relay board measures the electrical resistance of the KOH-solution. The signal from the relay board is digitalized in a 12-bit A/D convertor joined to a micro-computer, which calculates CO_2 evolution and evolution rate. The respirometer presented here was calibrated by standard solutions made from KOH and K_2CO_3 in different proportions($r^2=0.99$, $n=7$).