

Oxygen isotopes in phosphate to study soil P fractions and to trace sources of pollutants in agricultural catchment.

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Phosphorus (P) is one of the key elements for living organisms. It forms naturally in rocks and through the weathering processes, it enters soils. In soils, phosphate can react with different cations, enter different soil P pools, and behave differently under different soil pH. As phosphorus has only one stable isotope (³¹P) and mainly two radio-isotopes (³²P and ³³P) that are suitable for agronomic studies, the oxygen isotope composition of phosphate (δ^{18} O-PO₄) is used more often to study P processes. Several method papers that use the formation of silver phosphate to measure the δ^{18} O-PO₄ are well documented.

The principle of these studies is to extract phosphate from soil pools and through a series of purification processes to form silver phosphate, which is used to measure the oxygen isotope composition with isotope-ratio mass spectrometry (IRMS).

This poster shows the validation of the phosphate purification method for oxygen isotope analysis in different phosphorus fractions of a forest soil (*Humic Cambisol*) and an agricultural soil (Haplic Chernozem) from close to Vienna. The soil available P, NaHCO₃-extractable P, and the HCl-extractable P pools were selected for phosphate extractions, followed by the purification process.