

Article title	Comparison of Soluble P in Soil Water Extracts Determined by ion Chromatography, Colorimetric, and Inductively Coupled Plasma Techniques in PPB Range
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Abstract	<p>The determination of soil solution phosphate ions at trace levels is questionable with colorimetric method due to both limit of sensitivity and possible hydrolysis of organic soluble phosphate (P). A simple procedure was developed to determine orthophosphate at trace levels in soil solutions by single-column, suppressed-ion chromatography with conductivity detection without prior sample concentration. The procedure requires column capacity selection and use of a 500-μL injection loop. The method shows a detection limit of 0.05 μg P L⁻¹ as well as a high resolution with a Dionex AS9SC column. The proposed method was tested by analyzing 45 soil samples (Colombian oxisols) differently P fertilized. Phosphorus levels in solutions were also determined by green-malachite colorimetry and inductively coupled plasma as reference methods. The linear correlation between the various methods showed that analysis of orthophosphate in the ppb range by ion chromatography are likely more acceptable that value obtained with colorimetry, which hydrolyzed organic P and caused systematic error. Examination of coefficients of variation for the IC method calculated from triplicate analyses of five randomized samples (situated between 7.4 and 16.3 μg P L⁻¹) showed value ranged from 2.0 to 6.7%. The procedure allows precise measurements of trace amounts of orthophosphate in the presence of moderate background levels of salts such as chloride, nitrate, and sulfate ions and was adequate for routine analysis.</p>
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