

Article title	Identification of Compounds Present in Single Superphosphates Produced From Brazilian Phosphate Rocks Using Sem, Edx, and X-Ray Techniques
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Abstract	<p>Scanning electron microscope (SEM), energy dispersive X-ray (EDX) and X-ray techniques were used to obtain data about the mineralogical composition of single superphosphates (SSP) produced from apatite concentrates originating from Araxá, Jacupiranga, Catalão, and Tapira igneous phosphate rock deposits. The SSP samples were investigated both in their original form and after leaching with water to remove water-soluble compounds. Results of chemical analysis and instrumental techniques showed that P compounds were still present in the water-leached material. Anhydrite (CaSO₄ with no hydration water) was the main Ca-S component in the SSP samples. Monocalcium phosphate monohydrate [Ca(H₂PO₄)₂.H₂O] was identified in the original but not in the water-leached samples. Results of SEM, EDX, and X-ray confirmed the presence of crystals of triiron (III) potassium octahydrogen hexaphosphate hexahydrate [Fe₃KH₈(PO₄)₆.6H₂O] in the SSP. The results of SEM and EDX analyses suggested that the compounds triiron (III) nonahydrogen hexaphosphate hexahydrate [Fe₃H₉(PO₄)₆.6H₂O], triiron (III) 15-hydrogen octaphosphate tetrahydrate [Fe₃H₁₅(PO₄)₈.4H₂O], triiron (III) potassium 14-hydrogen octaphosphate tetrahydrate [Fe₃KH₁₄(PO₄)₈.4H₂O], and barium sulfate (BaSO₄) were present in some of the SSP samples. Use of SEM, EDX, and X-ray techniques was shown to be adequate for precise characterization of compounds present in the SSP studied, which will help to understand further the plant availability of the phosphorus contained (especially) in the water-insoluble P fraction of this fertilizer.</p>
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