

## **Kinetics of Nonexchangeable Potassium Release in Surface and Subsurface Horizons of Predominant Soil Series in Kohgilouye-va-Boyerahmad Province**

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### **Abstract**

The aim of this study was to assess the kinetics of nonexchangeable potassium release in surface and subsurface soil horizons, using organic and inorganic extractions, in Kohgilouye-va-Boyerahmad Province. Kinetics of  $K^+$  release was studied by successive extractions of K from 64 selective surface and subsurface soil samples, using 0.01 M  $CaCl_2$  and 0.01 M oxalic acid, for 1948 h, with two replicates. Nonexchangeable  $K^+$  release was fitted by Elovich, Pseudo-first order, Power function and Parabolic equations. Result showed that the average nonexchangeable  $K^+$  released (extracted by 1M  $HNO_3$ ) was 356 mg/kg, while those extracted by  $CaCl_2$  and oxalic acid after 1948 h were only 58% and 52% of the total amount of nonexchangeable  $K^+$  of the soils, respectively. In all soil samples, nonexchangeable  $K^+$  released by oxalic acid was less than that released by  $CaCl_2$ , due to the high buffering capacity resulting from high carbonates in the soils. Potassium release rate in Elovich and Parabolic equations were significantly correlated with non-exchangeable potassium and some physical and chemical characteristics. Based on high Coefficients of determination ( $r^2$ ) and low Standard errors (SE), Elovich, Power function, First order and Parabolic equations were selected as the best equations for prediction of  $K^+$  release from the soils.

**Keywords:** Kinetics of nonexchangeable Potassium, Kohgilouye-va-Boyerahmad, Oxalic acid, Calcium Chloride.

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