

Preparation of ammonium acetate (1.0 N solution);

To 700 ml of distilled water (in a 1L-glass beaker), 57 ml of acetic acid and 68 ml of ammonium hydroxide were added and mix together. The solution in the beaker was then stirred using magnetic stirrer. The pH of the solution was adjusted to pH 7.0 by adding using droplet acid (acetic acid) or base (ammonium hydroxide). The solution was then transferred to a 1-L volumetric flask and top up to the mark with distilled water.

4 g of air-dried and pulverised soil was accurately weighed into a plastic centrifuge tube. 33 ml of ammonium acetate solution was added and was shaken in a mechanical shaker for 1 hour. Then, the tube was centrifuged and clear supernatant was decanted into 100ml volumetric flask. The procedures above were repeated twice on the same soil and all supernatants were placed into the same flask and top-up to the mark with distilled water. It was then analysed for cations using ICPAES.

Calculations: -

(1) The cations in the flasks are extractable cations,

$$\text{Extractable cation (meq/100g)} = \frac{[\text{Concentration of cation in flask (meq/L)}] \times 10}{\text{Weight of soil (g)}}$$

(2) The amount of exchangeable cation was determined by subtracting the soluble cation in the porewater from extractable cations.

$$\begin{array}{rcc} \text{Exchangeable cation} & = & \text{Extractable cation} \quad - \quad \text{Soluble cation} \\ \text{(meq/100 g)} & & \text{(meq/100 g)} \quad \quad \quad \text{(meq/100 g)} \end{array}$$

The soluble cations were determined from the saturation extract test (Section 3.3.3). These calculations were performed for each cation species as well as for total cations.