# CHARGE CHARACTERISTICS AND ZPC OF SOME ALKALINE CALCAREOUS SOILS FROM FAISALABAD DISTRICT

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*Soil Samples from surface horizons of six barren saline-sodic and four cultivated soils were used to determine the magnitude of negative and positive charges by the adsorption of $K^+$ and $Cl^-$. The permanent charges were estimated by difference of total negative and positive charges; variable charges by $Cl^-$ adsorption and zero point of charge (ZPC) by the salt titration method. The negative and positive charges varied from 7.38 to 8.92 and 3.00 to 4.00 c mol (+) $kg^{-1}$ for normal soils while from 3.79 to 6.72 to 4.8 c mol (+) $kg^{-1}$ for salt-affected soils, respectively. The ZPC values (pH values) ranged from 6.53 to 7.29 for normal and from 7.22 to 7.49 for salt-affected soils. At ZPC, the permanent and variable charges varied from 3.94 to 5.0 and 2.80 to 3.24 c mol (+) $kg^{-1}$ for normal and from 1.10 to 6.50 and 1.40 to 3.50 c mol (+) $kg^{-1}$ for salt-affected soils, respectively.*

## INTRODUCTION

The charge on soil colloids could be negative and positive, each consisting of permanent and variable charges. The structural imperfections due to isomorphic sub-situation in tetra—and/or octahedral coordinations or site vacancies frequently result in permanent charge. Such colloids include 2:1 type silicate clays like hydrous micas, smectites and vermiculites.

Much of the work on the topic has been conducted in temperate region where soils are generally characterized by surfaces having a permanent constant surface charge. However, the soils in humid tropics have surfaces bearing a constant surface potential (Van Raij and Peech, 1972) changes in ZPC, due to $pH_s$, $EC_e$ and/or nature of electrolytes in soils like those of Pakistan. Hence, preliminary investigations were undertaken to assess the positive and negative charges, permanent and variable charges and ZPC of some alkaline calcareous soils from the Faisalabad District, Pakistan.

## MATERIALS AND METHODS

Samples from the surface horizons of six uncultivated saline-sodic and four cultivated nonsaline-sodic soils were collected (Table 1). After grinding and sieving through a 2 mm sieve, they were stored in plastic bottles at room temperature (28 ± 4°C). The physical and chemical