# Preliminary Studies of Electrical and Low Magnetic field Transport Process in Red Soils (Latosols) in Northern Sri Lanka

[1]Ketheeswaran, S., [2]Rajendram, K., [2]Srikaran, R. and [1]Ahilan, K.

The scope of the studies is to explore the electric and low magnetic field transport properties of $Fe^{3+}$ ion rich red soils in Northern Sri Lanka. Samples for these studies were collected at six different locations in Northern Jaffna peninsula. Chemical studies reveal a significant $Fe^{3+}$ ion variation among the samples. Studies further reports that the $Fe^{3+}$ ions are the major contributor in these soils than others.

Reported studies involve current-voltage (IV) measurements of these samples at room and at high temperatures (up to 185 $^0$C) of fresh, moisture-freed (115 $^0$C at 48 hrs), and annealed (1000 $^0$C at half an hour) conditions. The same studies extended to low magnetic fields (up to 1500 G) as well.

At the fresh condition moisture dominates and responsible for much of its transport properties. Also we reported that $Fe^{3+}$ ions are more responsible for the electrical and magnetic transport properties in the moisture-freed and annealed conditions. Further, significant variation in current-voltage characteristics at room temperature were observed among the samples. Even though these characters follow linear behaviour the quantitative values suggest that the samples are very close to insulators (or semiconductor-insulator boundary). High temperature measurements also support the claim that these ions are influencing in the transport properties.

[1]*Department of Physics, University of Jaffna*

[2]*Department of Chemistry, University of Jaffna*