

## **The Soil Redox Potential Method and its Combined Application with Soil Magnetic Susceptibility Aimed to Geological Prospecting**

<sup>1</sup>Pardo, M.E., and <sup>2</sup>Stout, R. <sup>1</sup>Instituto de Geología y Paleontología, Ciudad Habana, Cuba; <sup>2</sup>Instituto de Geología y Paleontología, Ciudad Habana, Cuba.

The soil Redox Potential method uses two electrodes connected to a digital milivoltmeter: a platinum inert one and a commercial copper non-polarizable of reference, both located nearly each other within a hole at the B soil horizon. Measurements have a transient behaviour; thus the potential is determinate by means of an algorithm from three readings with one-minute difference between them. As a complement, the soil magnetic susceptibility is measured by making a series of readings at the hole's floor and walls.

Geological prospecting applications are determinate by the possibility of reducing environment column detection which take place directly over metallic and hydrocarbon occurrences, reaching the upper part of the soil profile. Within this column is favoured the conversion of nonmagnetic iron minerals to magnetic varieties more stable, fact that explain the observed inverse correlation between both attributes and justify the methods integration. These techniques are used to complement the conventional prospecting complexes aimed to area reduction and target selection, with an increment of research geological- economic effectiveness.

For illustrate the contribution of this new unconventional technique, examples of applications over petroleum and metallic prospecting targets are presented. Over petroleum targets (structural traps) the spatial association of potential production areas with Redox Potential lows including a central relative high (coincident with the axial part of the structure) is characteristic. Magnetic susceptibility shows increments in these areas. Over metallic targets the correspondence of local Redox Potential lows and magnetic susceptibility increments is spatially associated with the vertical projection of primary mineralization.