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**pH-dependent Israeli fly ash characterization**

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**Abstract**

The use of coal ash in infrastructure, construction and agriculture depends on its definition as "usable ash". This criterion is application dependent and can be determined by evaluating the extent of metal leaching under specific environmental conditions in which the ash is used. From previous studies conducted in Israel and worldwide it is known that metal leaching depends strongly on the pH level and solid-liquid ratios. Most metal are soluble in low pH values (acidic environment) and their solubility decreases considerably with increasing pH values (basic environment). However, several metals such as molybdenum display inverse respond, hence their solubility increases with increasing pH. Therefore, solubility characterization as a function of pH is very important in establishing criteria for fly ash usage. This way, it will be possible to estimate the actual contamination potential subject to varied environmental conditions. The research aim is to establish pH characteristic curves for various elements which will permit evaluation of the concentrations expected to be released to the environment under particular applications and thus provide a much better prediction.

In recent years, characterization was carried out using the CEN / TC 292 procedure in a manual mode. In this method, attaining the desired pH does not allow precise level of acidity and the as it is manual it time consuming labor. In addition, the procedure is set depending on the final pH (after extraction for 48 hours) while considerable acidity changes could occur during the process. The current procedure follows prEN 14997:2004 (Influence of pH on waste leaching with continuous pH control) and performed with a pH-stat device (Titrand 902, Metrohm) in every pH unit between 4 – 12. The concentrations of the trace elements Ag, As, B, Ba, Be, Cd, Co, Cr, Cu, Mn, Mo, Ni, Pb, Sb, Se, Th, U, V, Zn are measured in the solution after 48 hours of extraction by Inductively Coupled Plasma Mass Spectrometry (ICPMS).