

FLY ASH BEHAVIOR IN WATER AND SOIL ENVIRONMENTS

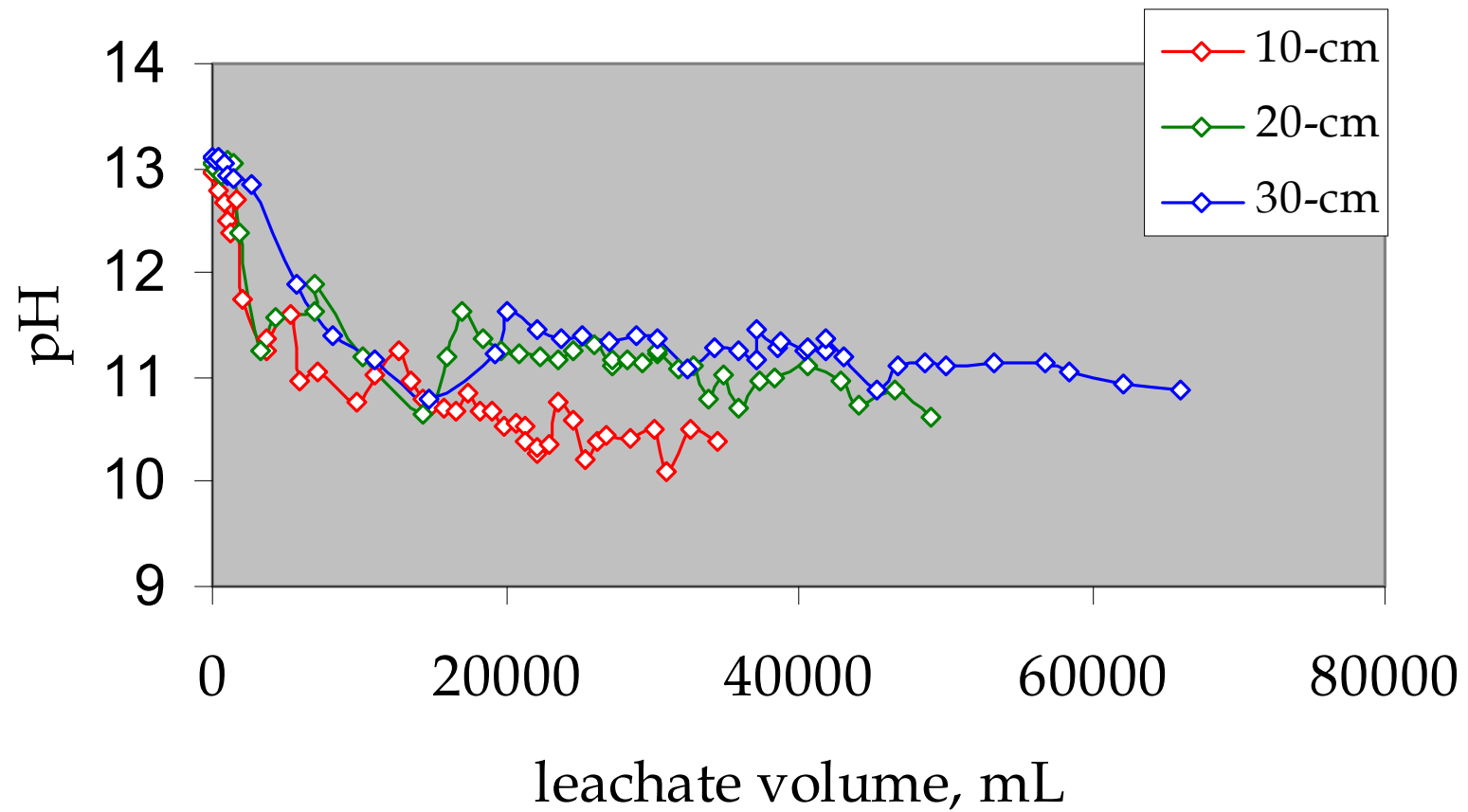
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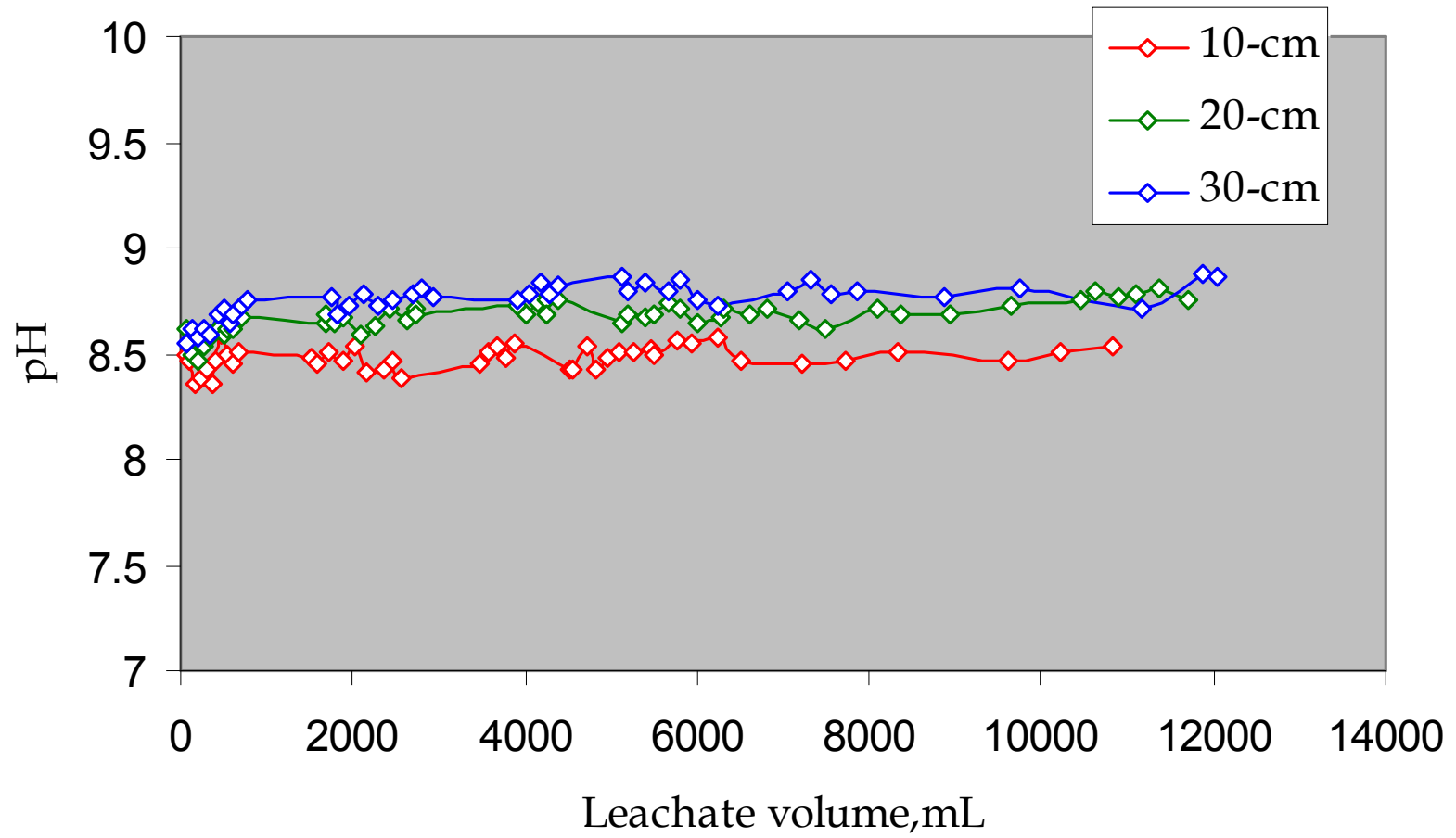
Fly ash from South Africa

- **Fresh and dry fly ash was kept isolated from atmosphere**
- **Aging time of wet fly ash (water content of 30-40%) exposed to atmosphere for 0,3,6,12 months**

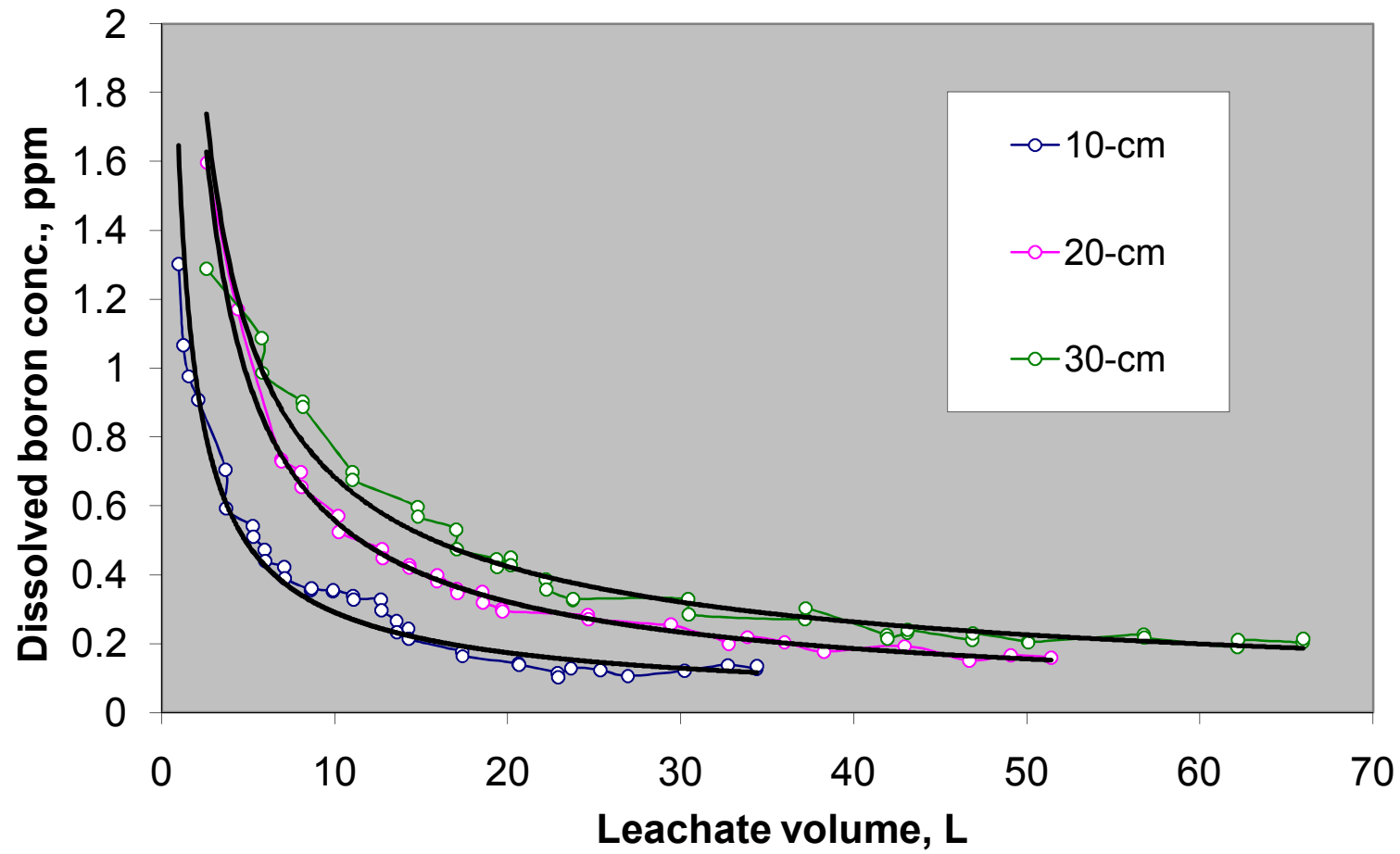
pH, t=0 months



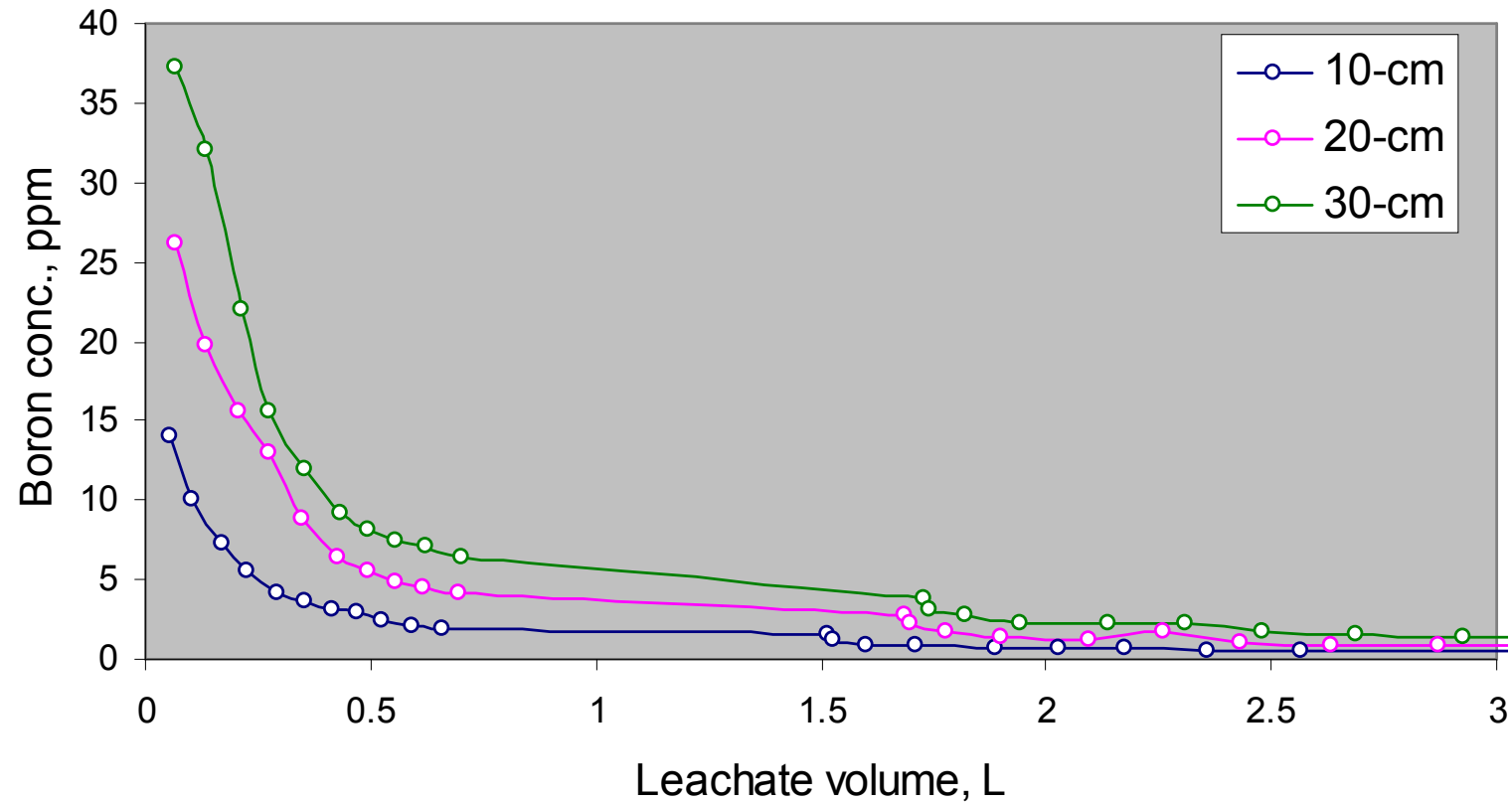
pH, t =12 months



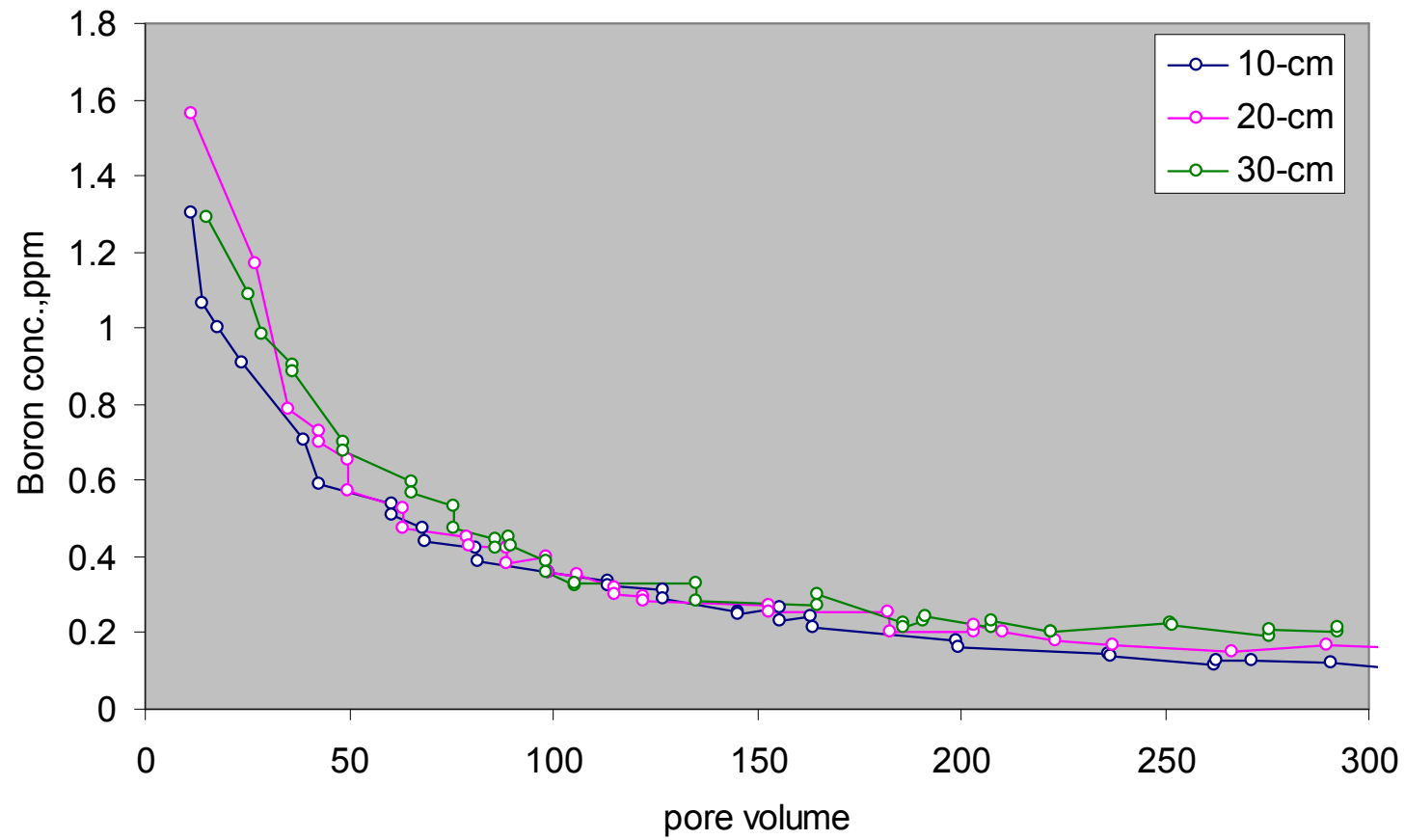
Boron concentration in leachate, t₀



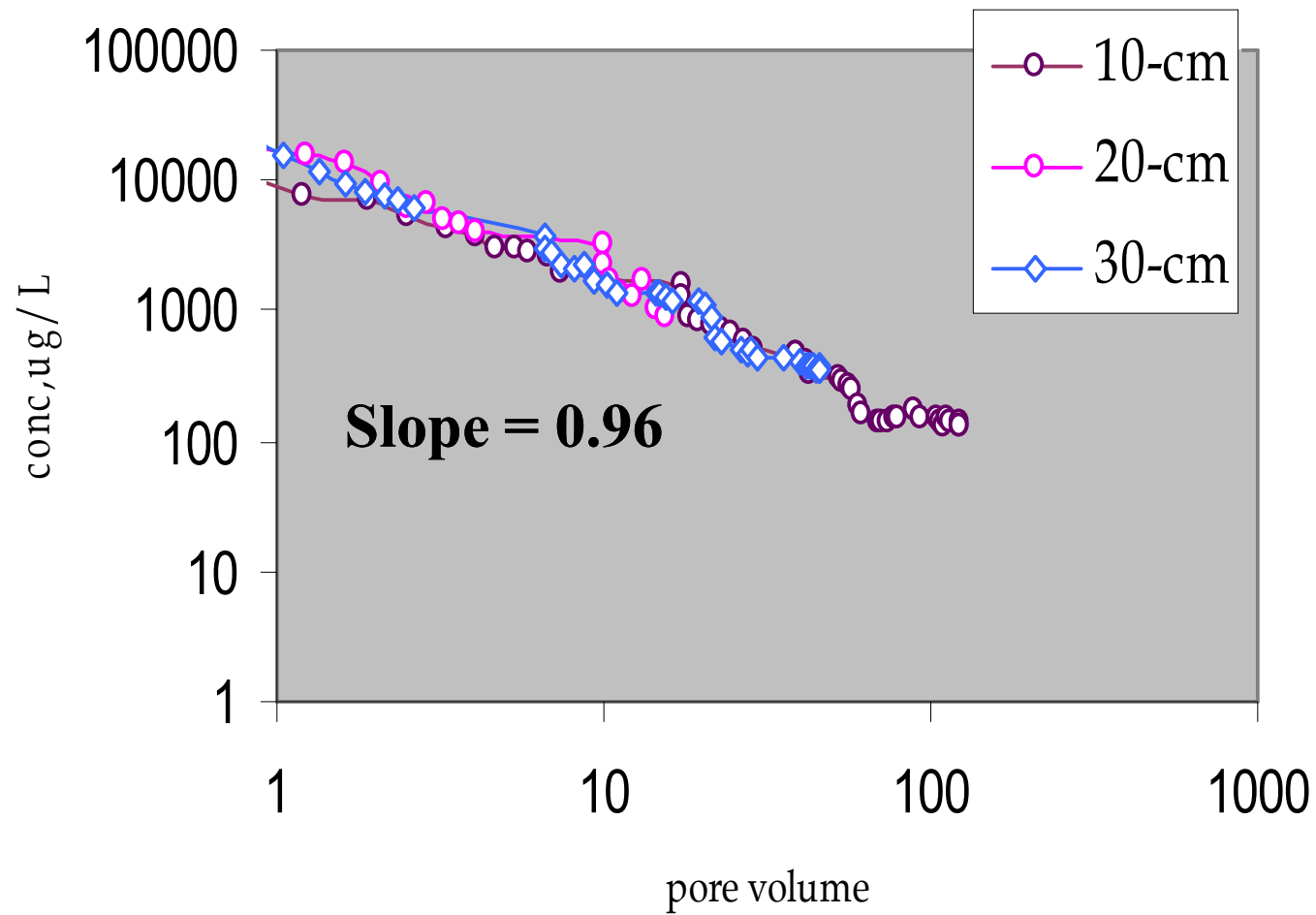
Boron concentration in leachate, t = 12 months



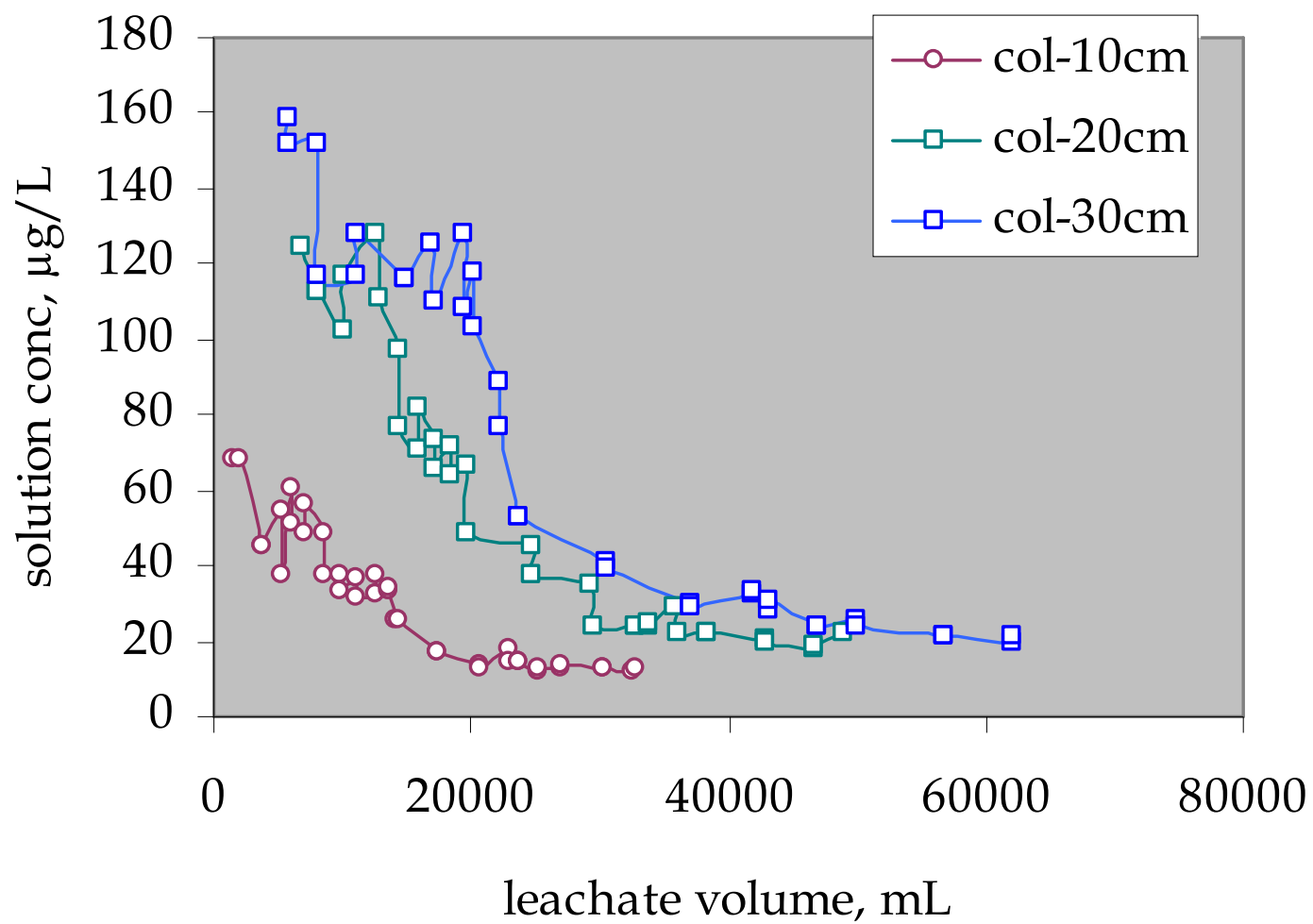
Boron concentration in leachate, t = 0 month



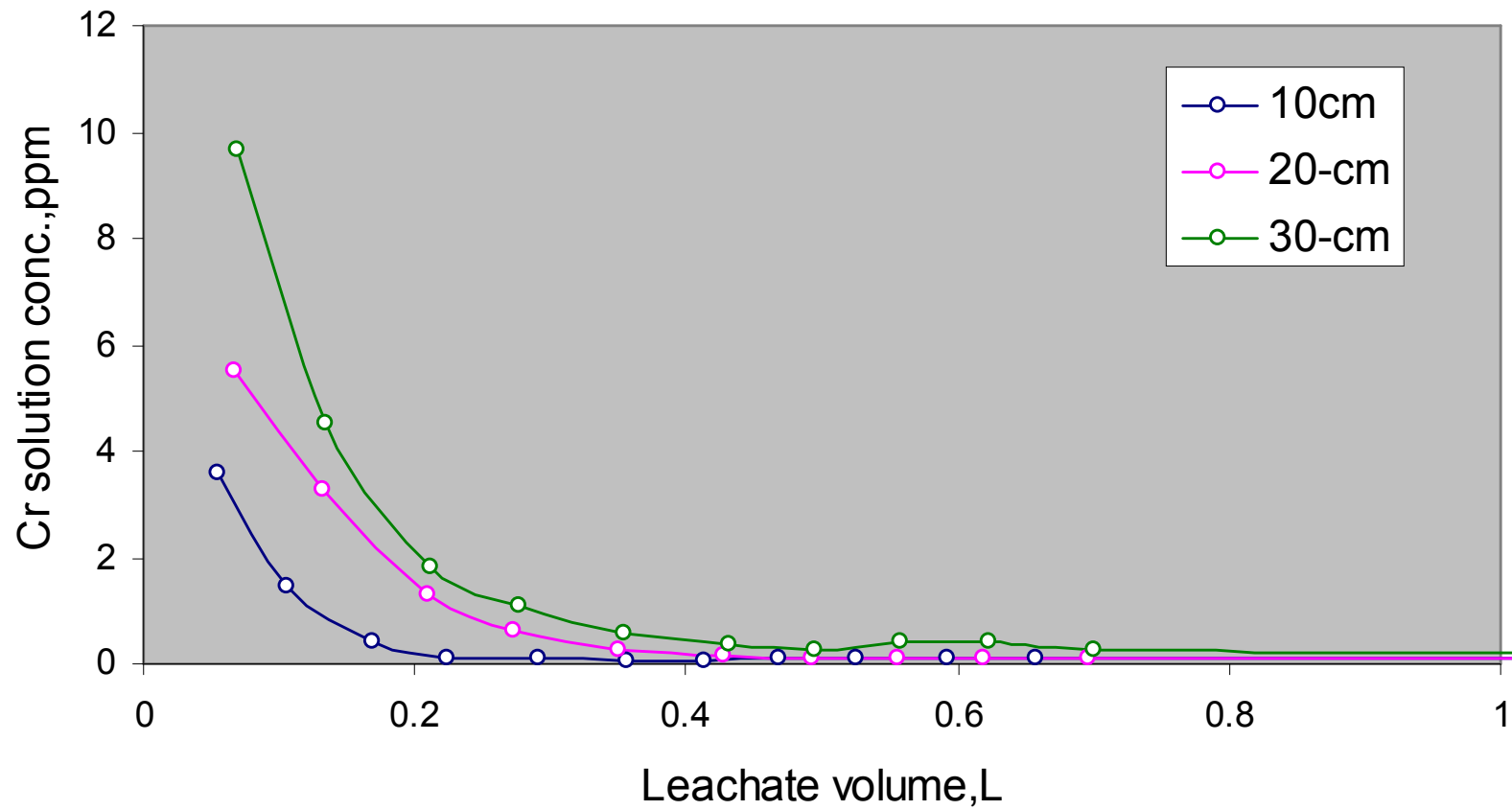
Boron concentration in leachate, t=12month

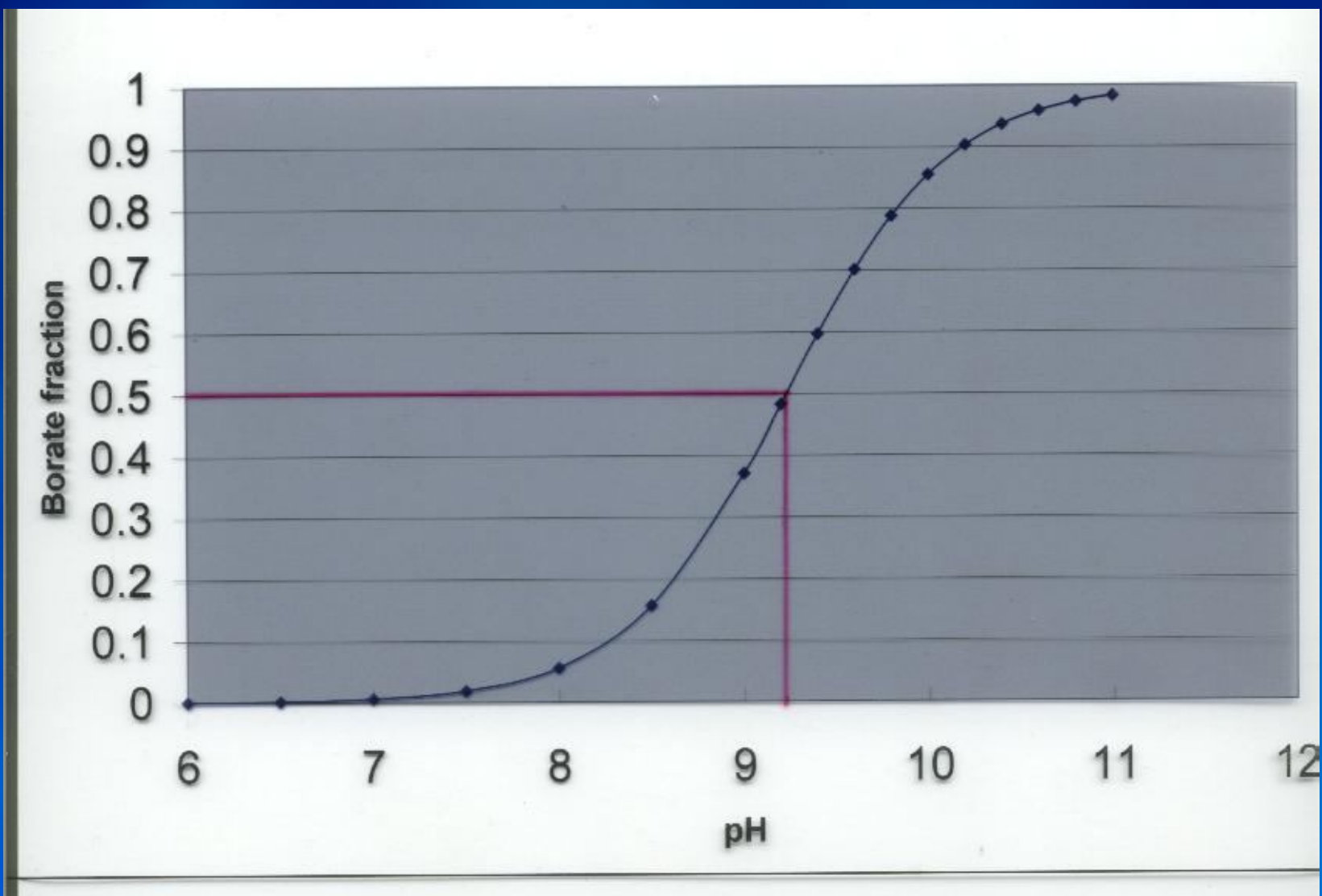


Chromium concentration in leachate, t=0month



Chromium concentration in leachate, t = 12 months





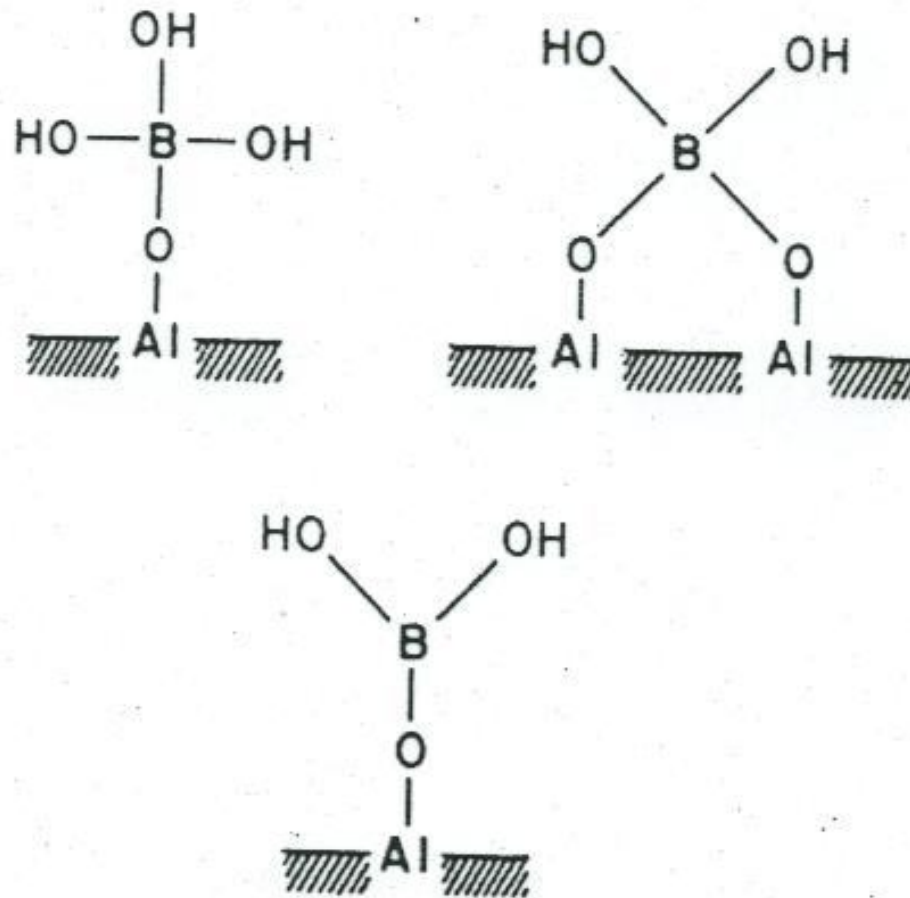
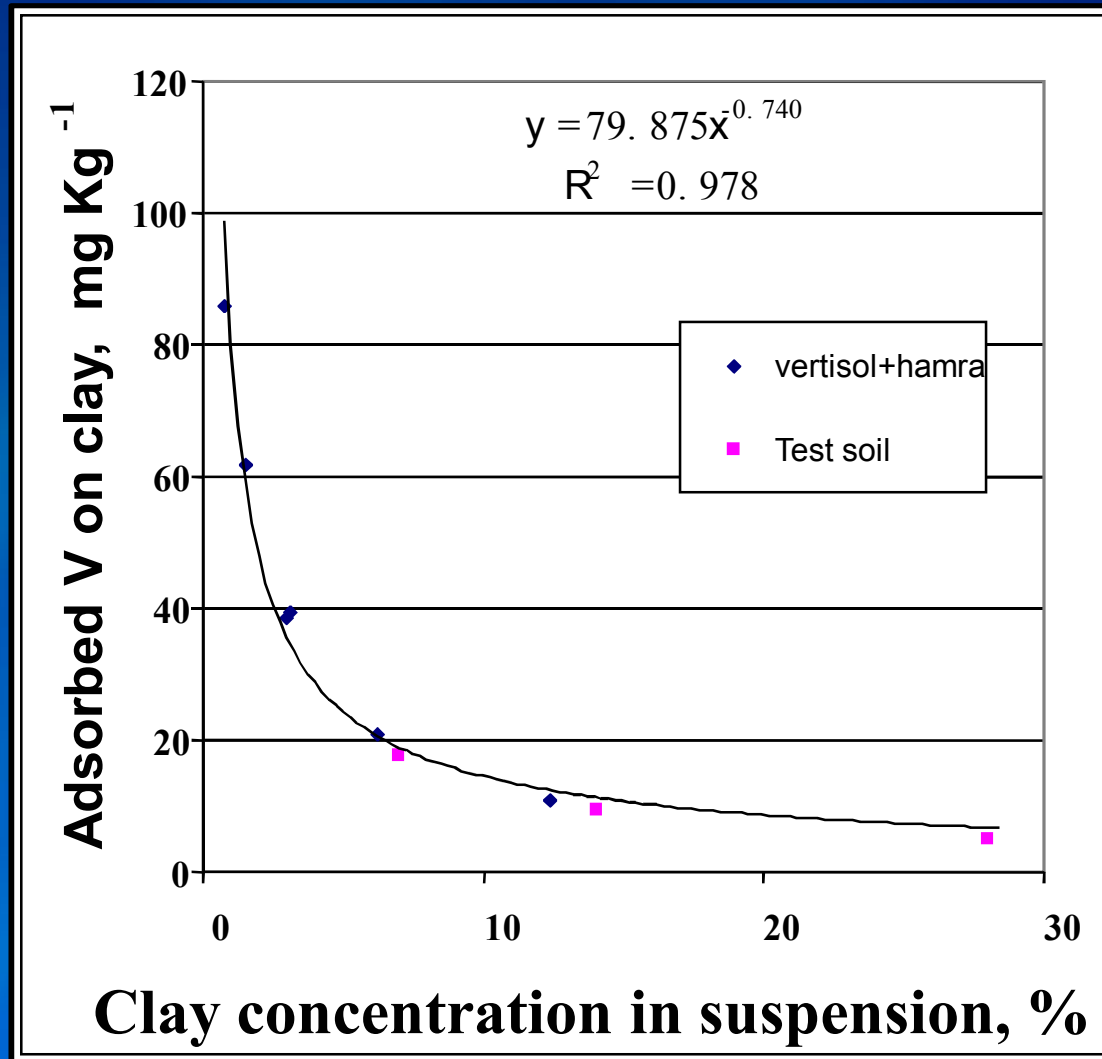


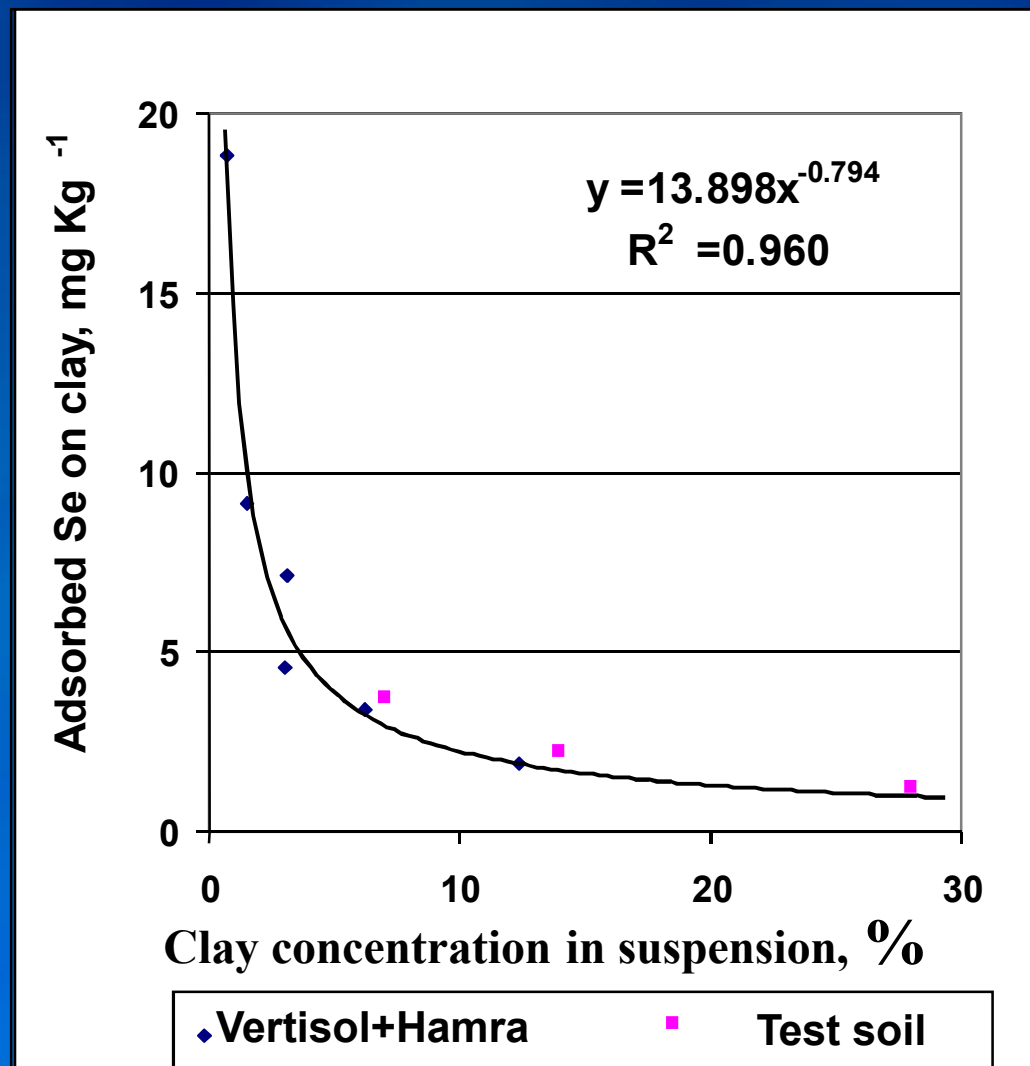
Fig. 1. Possible configurations for B sorbed by surface Al as suggested by Keren and Bingham (1985).

$$Q_B = T \left\{ 1 + \frac{PR}{F(Q_T - Q_B)} [1 + K_{OH}(OH)] \right\}^{-1}$$

$$P = 1 + K_h * 10^{14} * (OH)$$

$$F = K_{HB} + K_B (P - 1)$$





$$Q_v = 79.875 * X^{-0.74}$$

$$Q_{se} = 13.898 * X^{-0.794}$$

CONCLUSIONS

- **The leachate pH decreases with the exposure time of the moist fly ash to the atmosphere**
- **Except V, the oxyanions concentration in the leachate increases as the pH decreases at any given leachate volume**
- **The B, Mo, Cr and V concentrations in the leachate increase with the length of the fly ash column at any given leachate volume**
- **The oxyanions concentrations in the leachate are independent of the fly ash column length when the leachate volume is presented as pore volumes**

- **The adsorption models for the benchmark soils simulated well the tested soil**

THANK YOU

