
Formation of Aluminum Hydroxides as Influenced by Aluminum Salts and Bases

K. P. Prodromou¹ and A. S. Pavlatou-Ve²

¹ Laboratory of Applied Soil Science, Aristotelian University of Thessaloniki 540 06 Thessaloniki, Greece

² Laboratory of Soil Science, Aristotelian University of Thessaloniki 540 06 Thessaloniki, Greece

Abstract: The influence of different ions in the formation of $\text{Al}(\text{OH})_3$ polymorphs has been studied experimentally by promoting stoichiometric reactions between the aluminum salts (AlCl_3 , $\text{Al}(\text{NO}_3)_3$, $\text{Al}_2(\text{SO}_4)_3$) and bases (NaOH , KOH , NH_4OH). In all cases the polymorphs obtained were a mixture of gibbsite, bayerite and nordstrandite or pseudoboehmite with the exception of the reaction between KOH , or NH_4OH and $\text{Al}_2(\text{SO}_4)_3$ which produced amorphous gels. Ageing of these gels at ambient temperature and pressure for 180 days or at 60°C for 20 days resulted in crystalline structure. Specifically, pseudoboehmite was crystallized from the reaction between $\text{Al}_2(\text{SO}_4)_3$ and NH_4OH . Significantly, of all ions present in solution in the present experiment, only the sulphate ones were observed to have a marked influence in the precipitation of Al oxyhydroxides.

Key Words: Aluminum hydroxides • Pseudoboehmite • Sulfates

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