
Interaction of Clay Minerals with Adenosine-5-Phosphates¹

G. Graf and G. Lagaly

Sonderforschungsbereich 95: " Wechselwirkung Meer-Meeresboden" Universität Kiel, Olshausenstrasse 40/60, 2300 Kiel, Germany
Institut für anorganische Chemie der Universität Kiel, Olshausenstrasse 40/60, 2300 Kiel, Germany

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Abstract: Adenosine-5-phosphates (ATP, ADP, AMP) are adsorbed by clay minerals at very low concentrations (2 mg/liter). In contrast to quartz, the clay minerals exhibit a strong preference for ATP over AMP. The experimental data are expressed as recovery rates (adenosine-phosphate in solution to total nucleotide added). For example, the recovery rates of ATP, ADP, and AMP in the presence of sodium montmorillonite are 0, 17, and 100%; in the presence of quartz 95, 100, and 99%. The recovery rate of AMP on clays is markedly decreased by the presence of ATP, that is, ATP increases the adsorption of AMP by cooperative interactions.

A part of ATP not recovered in the equilibrium solution is dephosphorylated to ADP. For example, 45% of ATP not recovered in equilibrium solution with calcium montmorillonite is recovered as ADP; with sodium montmorillonite only ADP can be recovered in solution.

Key Words: Adenosine-5-phosphate • Adsorption • Anion exchange • Illite • Montmorillonite

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