

Interaction of Alkaline Earth Metal Ions with Carboxylic Acids in Aqueous Solutions studied by ^{13}C NMR Spectroscopy

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Z. Naturforsch. **53a**, 77–91 (1998); received December 30, 1997

^{13}C NMR spectroscopic measurements of aqueous solutions containing alkaline earth metal chloride and a carboxylic acid have been carried out to acquire some insight into the coordination manners of various carboxylic acids to alkaline earth metal ions. The dependence of the ^{13}C NMR signal positions of the carboxylate carbons on the magnesium ion concentration in a magnesium carboxylate system is a good index to understand the coordination manner of the carboxylate ion. The upfield shift of the carboxylate carbon signal with increasing magnesium ion concentration indicates that the carboxylate ion acts as a bidentate ligand to form a ring structure. Only in the citrate systems, the existence of a relatively stable complex is evidenced in which the citrate ion is expected to act as a tridentate ligand.

Key words: ^{13}C NMR Spectroscopy, Carboxylic Acids, Alkaline Earth Metals, Coordination, Chemical Shifts.

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