Low-Temperature Processes in the System Aluminum Chloride–Nitroalkane: III.[1] Products of Solid-Phase Low-Temperature Reactions of Aluminum Chloride with Nitroalkanes

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Abstract - Solid-phase reactions of aluminum chloride with nitroalkanes, with nitromethane and 1-nitropropane as examples, were studied by low-temperature IR spectroscopy. Reaction of the components in the 2 : 1 ($Al_2Cl_6 \cdot RNO_2$) and 1 : 1 ($AlCl_3 \cdot RNO_2$) complexes at 170–230 K results in dehydration of the nitro compounds to form nitro oximes and furoxane derivatives. The intermediate ionic complexes of the reactants were detected under conditions of limited molecular mobility. The resulting condensation products of nitroalkanes are bound in molecular complexes with anhydrous or partially hydrolyzed aluminum chloride.