ULTRASOUND-FORCED ACTIVATION OF ALKANES IN ANHYDROUS HYDROFLUORIC ACID SYSTEMS

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The nonconventional alkylation of benzene with 2,2,4-trimethylpentane in the presence of super acids was described to give tert.butylbenzene, di-tert.butylbenzenes and isobutane, mainly. We found, that this reaction is accelerated by sonification in a common laboratory ultrasonic cleaner (17 kHz). A comparison with intensive stirred batches indicates, that only 10 - 20 % of the reaction time is necessary for a analogous degree of conversion, partially. Different strong acidic catalysts was investigated by means of this model reaction. It was found the following sequence of catalytic activity:

The conjugate superacid 1 has been demonstrated so active, that the alkylation reaction already without action of ultrasound was locked up after 15 min. under strong evolution of isobutane. There is obtained in the presence of catalyst 2 a degree of conversion of 50 % after 2 h (without sonification) and after 15 min. (with sonification), respectively.