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WATER SOLUBLE Rh/Ru CATALYTIC SYSTEMS IN HYDROAMINOMETHYLIZATION OF OLEFINS WITH THE USE OF METHYL FORMATE AS ALTERNATIVE SOURCE OF SYNTHESIS GAS

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Hydroformylation reaction is described as interreacting of unsaturated compounds with synthesis gas. Nowadays, this is one of the main industrial ways of producing of aldehydes and alcohols, besides, hydroformylation is a perspective for wide use in fine chemical synthesis. In particular, creating of tandem processes based on hydroformylation is possible due to high reactivity of aldehydes [1]. The advantage of such processes is that the desired product is obtained in one step from the original unsaturated compound, and the steps of purification and isolation of the intermediate reagent are not required. One of such tandem reactions is hydroaminomethylation (Fig.1).

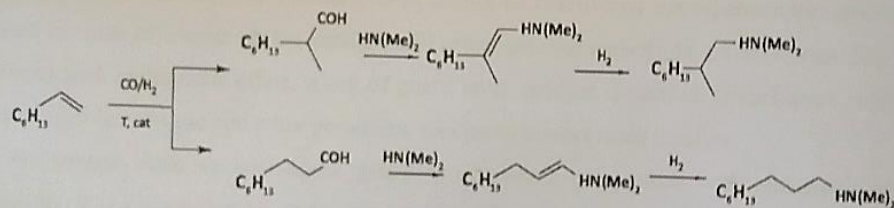


Fig. 1. Hydroaminomethylation of 1-octene

For hydroaminomethylation gas mixture CO+H₂ riched with H₂ is necessary, that leads to negative effects to ecological and technological safety and also results in requirement of transportation of high amounts of toxic and explosive gases to long distances. Using of methyl formate as alternative source of synthesis gas can help to solve this problem. Catalytic decomposition of methyl ester in the presence of precious metals and water leads to CO and H₂ generation in proportion from 1:1 to 2:1 [2] (Fig. 2), obtained pressure is enough for reaction of hydroformylation in temperature range 100-200°C. Availability and respectively low price for methyl formate make it possible to consider it as an attractive initial product for wide use in petroleum chemistry.