"CONJUGATED" HYDROGENOLYSIS OF THE FURAN RING

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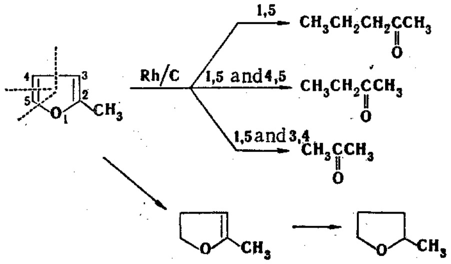
Hydrogenolysis of the furan ring on all of the previously studied catalysts has proceeded exclusively with cleavage of one of the C−O bonds and the formation of an aliphatic compound. An exception to this was a Raney nickel−aluminum catalyst, on which the furan ring underwent hydrogenolysis with cleavage not only of C−O bonds but also of C−C bonds [1]. We have observed that under pulse conditions and in a flow system α-methylfuran undergoes both hydrogenation and hydrogenolysis on rhdoium catalysts at normal pressure and 150-400°C to give methyl propyl ketone, methyl ethyl ketone, and acetone:



Under pulse conditions, "conjugated hydrogenolysis" becomes appreciable on an Rh−C catalyst at 180°. At 300-350°, the ratio of the ketones indicated above is 4 : 2 : 1. The rate of formation of methyl propyl ketone is even higher ina preparative reactor, and the ratio is 5 : 2 : 1.

For the first time we have obtained α-methyldihydrofuran during vapor phase hydrogenation of α-methylfuran; the formation of α-methyldihydrofuran derivatives was previously observed [2, 3] only during liquid phase hydrogenation.

LITERATURE CITED

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