MANGANESE (III) ACETATE-INITIATED RADICAL REACTION OF ACETONE WITH BENZENE

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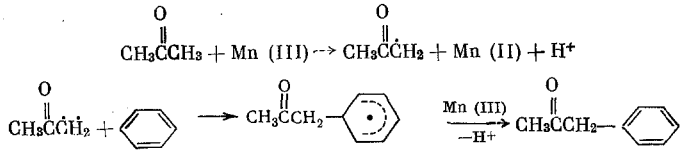
A simple method was recently proposed for the generation of acetonyl radicals by the one-electron oxidation of acetone by manganese (III) acetate [1, 2].

We have found that the radicals obtained are capable of adding to benzene:



The reaction of 0.1 mole of $Mn(OOCCH_3)_3 \cdot 2H_2O$ with 2 mole of acetone and 0.5 mole of benzene in 100 ml of acetic acid at 70° yielded 0.018 mole (36%) of methyl benzyl ketone [here and elsewhere the yield based on Mn(III) is indicated in parentheses]. The reaction of $CH_3C\dot{O}CH_2$ with toluene under the same conditions takes two directions: the formation of tolylacetone (30%) and benzyl acetate (7%).

In contrast to $CH_3C\dot{O}CH_2$ radicals, sec- and tert-α-oxoalkyl radicals $RR'\dot{C}COR$ (R = alkyl, and R' = H or alkyl) do not add to benzene but primarily recombine with one another. For example, $CH_3CH_2COCH_2 \cdot C_2H_5$ (2%) and $(CH_3COCHCH_3)_2$ (16%) were obtained by the reaction of methyl ethyl ketone with Mn(III) acetate in the presence of benzene. In the case of dipropyl ketone, only its dehydro dimer, viz., $(C_7\dot{H}_{13}O)_2$ (32%), was isolated. The physical constants and spectral characteristics of the compounds obtained are in agreement with the literature data.

LITERATURE CITED

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