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Features of structure methylbenzene carbohydrazones and methylhydrobenzene carbohydrazones

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Abstract

In recent years the interest to hydrazones has arisen. It is associated with a wide spectrum of their biological effects and applications in medicine and agriculture. Compounds having properties of herbicides, insecticides, fungicides, plant growth regulators and anti, anti-carcinogenic and antiprotozoal properties have been found among them. Hydrazones of structural isomers toluic hydrazide, tetra and hexahydro toluic acids with nuclear-substituted aldehydes, diacetyl monooxime, mono- and dioxo derivatives of the acids have been synthesized in this paper. Condensation of hydrazides of 2(3)(4)-metylbenzoic acid with substituted benzaldehydes leads to hydrazones, that forming mixture of *E*-hydrazones with *cis*-, and *trans*-amide groups in a crystalline state. In solution, these are only hydrazones in $E_{C=N}E_{N-N}Z_{N-C(O)}$ conformation as well as hydrazone from γ-oxo acid as the aldehyde component. Only exception is the compound with the *o*-methyl substituent in a fragment of hydrazide, in that case a mixture of $E,Z_{(C=N)}$ isomers formed. The same structure was observed for hydrazine with α-hydroxy acid (isatin) as the aldehyde component. Hydrazones based on β-hydroxy acids exist as a mixture of $E,Z_{(C=N)}$ isomers with dominance of the *syn*-form. *Z*-isomer is stabilized by an intramolecular hydrogen bond. The reaction of hydrazides with α-,γ-dioxoacids results in a linear *E*-hydrazone which is in tautomeric equilibrium with pirazole form. A feature of hydrazones with hydrotoluilic fragment is their existence in solution and in crystalline form as a mixture of *E,Z-cis*-conformational isomers of the amide group. The synthesis of the obtained compounds is extremely simple and it is in boiling equimolecular amounts of the corresponding hydrazide and a carbonyl compound in an environment of absolute alcohol. The reaction time of substituted benzaldehydes for 20-30 minutes keto compounds is 1 hour. The structure of the obtained hydrazones has been established by IR and ^{1}H NMR spectroscopy. The individuality of the compounds has been confirmed by thin layer of chromatography. The resulting hydrazones can be used for planning of the synthesis and study of such compounds as biologically active ingredients in agriculture and medicine.

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