Synthese und Aggregatbildung eines 5-Hydroxy-2,5-dihydropyrrols. Enantiomerenreine, eindimensionale Stränge durch Wasserstoffbrückenbindungen und chiroselektive Selbstorganisation [1]

Synthesis and Aggregation of a 5-Hydroxy-2,5-dihydropyrrole. Enantiomerically Pure, One-dimensional Strands via Hydrogen Bonds and Chiroselective Self Organization [1]

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2(5H)-Furanones, Hydrogen-Bonding, Chiral Recognition, One-Dimensional Strand, Crystal Structure

Reaction of dimethyl 1,3-acetonedicarboxylate **8** with oxalylchloride **2** and magnesium chloride as catalyst yielded 2,3-dioxo-2,3-dihydrofuran **9**, which is in equilibrium with tautomer **10** (**9**:**10** = 1:2). Addition of thionyl chloride to a mixture of **9**/**10** afforded 3-chloro-2(5H)-furanone **11**. The structure of **11** was unequivocally established by X-ray diffraction, which indirectly proved the structure of **10** as well. Ring opening of **11** by nucleophilic attack with benzylamine **14** in C2-position and subsequent recyclization led to racemic 3-chloro-5-hydroxy-2-oxo-2,5-dihydropyrrole **15**. According to a single crystal X-ray analysis, **15** aggregates via stereospecific self selection through hydrogen bonds to give chiroselectively the one-dimensional strands $^{1}_{\infty}$[(*S*)-**15**] and $^{1}_{\infty}$[(*R*)-**15**].

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