

# SYNTHETIC PATHWAYS TOWARDS CARBOHYDRATE-SUBSTITUTED ALPHA-DIKETONES

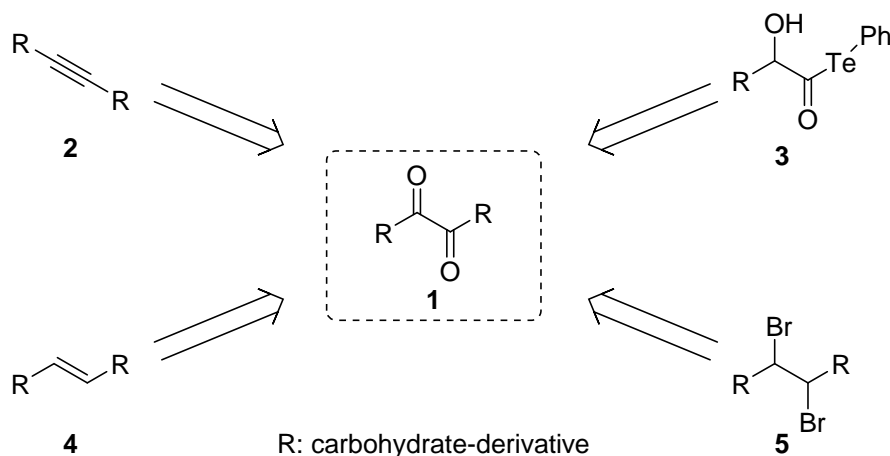
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Carbohydrate-substituted alpha-diketones (1) occur as intermediates in the Maillard-reaction and are called diuloses.<sup>[1]</sup> Some derivatives of this class determine the color and flavor of our food. Nevertheless, parts of the diulose-containing mexican plant *Psacalium peltatum* are used as natural medicine against rheumatism and type 2 diabetes.<sup>[2]</sup> Therefore, the synthesis and possible application of carbohydrate-substituted alpha-diketones are currently under investigation.

Here, we present four different synthetic routes towards diuloses. One approach is the direct oxidation of a cross-coupled alkyne (2), as an alternative route we tried a decarbonylative radical-radical coupling reaction with alkoxyacyl tellurides (3).<sup>[3]</sup> Diketones can also be obtained by dihydroxylation and oxidation of an alkene (4) or direct oxidation of alpha-dibromides (5).<sup>[4]</sup>



[1] L. C. Maillard, *Compt. Rend.* **1912**, 154, 66-68.

[2] a) C. Contreras, R. Roman, C. Perez, F. Alarcon, M. Zavala, S. Perez, *Chem. Pharm. Bull.* **2005**, 53, 1408-1410; b) F. J. Alarcon-Aguilar, R. Roman-Ramos, M. Jimenez-Estrada, R. Reyes-Chilpa, B. Gonzalez-Paredes, J. L. Flores-Saenz, *J. Ethnopharmacol.* **1997**, 55, 171-177.

[3] K. Masuda, M. Nagatomo, M. Inoue, *Nat. Chem.* **2016**, 9, 207.

[4] D. Villemin, M. Hammadi, *Synth. Commun.* **1995**, 25, 3145-3148.