NEW GLYCOCONJUGATES CONTAINING SELENIUM AND POLYPHENOLS

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Selenium (Se) is recognized as a trace element essential for human health. Many natural occurring Se compounds show redox and biologically capacities, thus stimulating synthesis of new molecules with the aim to spread antioxidant effects in biological systems.[1] However, their clinical use seems to be compromised by the low solubility in water.[2] A possible strategy to overcome this barrier is to combine the pharmacological properties of Se with the physicochemical properties of sugars, leading to the class of selenosugars and their derivatives. Moreover, polyphenols are molecules with antioxidant capacity, [3] therefore, the design of new molecules that present synergistic properties between the different antioxidants could be useful to develop possible therapeutic agents. [4] To this end, the Mitsunobu reaction mechanism, which covalently links the primary alcohol function of Se-based glycosyl donors from commercially available D-mannose and the phenolic moiety acceptors, has been used to obtain the corresponding glycoconjugates, providing products with efficient yields. A DFT theoretical study is carried out to help understand the possible influence of the seleno donor on the reactivity. Essentially, a new pathway based on Pummerer-like rearrangement followed by a glycosylation, gave a selenosugar with Se in the ring and bearing an acetal-like functional group at C-1. All compounds are characterized by nuclear magnetic resonance (NMR) spectroscopy confirming their structures and purity.

References

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