



Europa Bioproducts Ltd

15-17 North Street • Wicken
Ely • Cambridgeshire • CB7 5XW
Tel: 0044 (0)1353-721118
Fax: 0044 (0)1353-624589

3-Deoxyglucosone

Item# Unit Size
D535-08 1 mg

Chemical Name: 3-Deoxy-D-erythro-hexos-2-ulose

CAS: 4084-27-9

Appearance: white or pale yellow solid

Purity: ≥99.0% (HPLC)

MW: 162.14, C₆H₁₀O₅

Application: Standard for 3-DG analysis, intermediate of AGE

Storage Condition: -20°C

Shipping Condition: protect from moisture with blue ice or dry ice

Product Description

Advanced glycation end-products (AGEs) have been studied as one of the causes of diabetic complications. Several compounds have been identified as AGEs, including pyralline, pentosidine, imidazolone, and pyropropyridine. Glyoxal and methylglyoxal are reactive dicarbonyl compounds generated by glucose self-oxidation that are known to be AGE precursors. Another dicarbonyl compound, 3-Deoxyglucosone (3-DG), is also known to be one of the AGE precursors. 3-DG is derived from the Amadori rearrangement products of proteins and sugars in early stages of the Maillard reaction. 3-DG is also derived from fructose, which is present in high levels in diabetic patients, by a self-condensation reaction. Fructose-3-phosphate has been found to enhance cross-linking reactions of lens proteins in a diabetic rat model. Therefore, 3-DG derived from fructose-3-phosphate has been studied as a possible cause of cataracts. Dr. Miyata and others reported that the 3-DG serum level in a diabetic rat model was 918 nM (normal level: 379 nM) and it was suppressed to 695 nM after 3 weeks of feeding aminoguanidine (50 mg/kg/day), an inhibitor of protein glycation. This suggests that compounds with 3-DG quenching activity may have clinical uses. 3-DG may be involved in other diseases as well. Dr. Niwa and others reported that uremia patients had elevated 3-DG levels, and that the 3-DG levels of diabetic uremia patients were even higher. There is also evidence that 3-DG inhibits DNA synthesis, suppressing cell proliferation as a consequence. Though several roles of 3-DG have become clear, many remain unknown. Glyoxal and methylglyoxal are other reactive dicarbonyl compounds generated by glucose self-oxidation that are known to be AGE precursors. There are two methods for determining 3-DG levels: HPLC and mass spectrometry (MS). However, there is some discrepancy between the HPLC and MS methods when measuring 3-DG levels in vivo. HPLC analysis is based on a fluorescent compound, 2-(2, 3, 4-trihydroxybutyl)-benzo[g]quinoxaline, generated by a coupling reaction between 3-DG and 2, 3-diaminonaphthalene. Analogs of 2, 3-diaminonaphthalene, such as 1, 2-diamino-4, 5-dimethoxy-benzene and 1,2-diamino-4,5-methylenedioxybenzene, can also be used. 3-DG can be utilized for AGE production or as a standard for 3-DG level detection in plasma or serum samples.



CERTIFICATE NO. 3222

E-mail: info@europa-bioproducts.com

Web site: <http://www.europa-bioproducts.com>

Registered Office: 15-17 North Street, Wicken, Ely, Cambridgeshire CB7 5XW

Registered Number: 2703381