ONLINE ISSN : 1881-3984
PRINT ISSN : 1344-6606

Food Science and Technology Research
Vol. 10 (2004) , No. 2 pp.180-185

[PDF (922K)] [References]

Scavenging Effects of L-Ascorbic Acid on 1,1-Diphenyl-2-picrylhydrazyl in Homogeneous and Heterogeneous Reaction Systems

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(Received: September 30, 2003)
(Accepted: December 20, 2003)

To obtain basic information on the effect of the dissociation of L-ascorbic acid (AsA) on its radical scavenging ability, 1,1-diphenyl-2-picrylhydrazyl (DPPH) was used in both homogeneous and heterogeneous reaction systems. In the homogeneous system, the dissociation of AsA did not affect its DPPH scavenging ability. In the heterogeneous system, the DPPH scavenging ability of the monoanion form of AsA was lower than that of the non-dissociated form. The same tendency was also found in the case of DPPH in liposome. Although it has been emphasized that the antioxidant ability of AsA originated from its electron donation function, the ability of AsA to act as a hydrogen donor should also be considered. A new aspect of the possibility of AsA functioning as an antioxidant not only in the hydrophilic region but also in the hydrophobic region, was also strongly suggested.

Keywords: ascorbic acid, erythorbic acid, 1,1-diphenyl-2-picrylhydrazyl, radical scavenging ability

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