Selective Oxidation and Gas Chromatographic Determination of Ascorbic Acid, Serine and Histidine in Pharmaceutical Formulations

K. Kargosha, M.Kheirollahpour, S.R.Moeinossadat

Chemistry and Chemical Engineering Research Center of Iran, Tehran po.Box 14335-186.

K-kargosha@yahoo.com or K.kargosha@ccerci.ac.ir

A novel method based on selective oxidation of ascorbic acid, (AA), serine (Sr) and histidine (His) into gaseous species and consequent determination using gas chromatography equipped with the Methanizer and FID detection is reported.

A glass Vial of 10 ml Volume containing 5 ml of sample with adjusted pH is placed in the automatic injection Head Space at 70°C, Ar flow is passed through the vial for 4 min, 2 ml of oxidant solution is injected and the oxidation reaction carried out for 10 min. 100 µl of the generated gas in vial is injected into the capillary column of GC.

Ascorbic Acid was oxidized into CO₂ using sodium iodate at pH of 1.0 at the presence of phosphoric acid. The calibration graph in AA. measurement was linear in the range of 5-150 ppm and RSD was 1.70% (n=5). Beside the AA, Dehydroascorbic acid and 2,3 Diketogulonic acid also could be oxidized into CO₂ and measured. Among amino acids, the L-cysteine was found to cause severe interference in this oxidation reaction [1]. This interference was controlled by masking L-cysteine with p-benzoquinone.

Serine was oxidized into CO₂ using sodium metaperiodate at pH of 2.5. The calibration graph in Sr. measurement was linear in the range of 2-45 ppm and RSD was 2.10% (n=6).

Histidine was also oxidized into CO₂ by using sodium metaperiodate but at PH of 6.0. In His.determination, the calibration graph was linear from 2 up to 35 ppm. RSD was 1.2 %(n=5).

KEYWORDS: ascorbic acid, Serine, Histidine, Selective oxidation.

REFERENCES: