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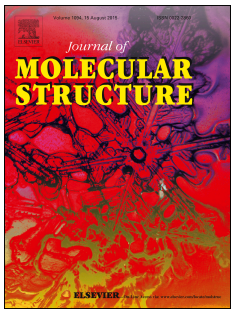

EPR investigation of gamma-irradiated L-citrulline, α-methyl-DL-serine, 3-fluoro-DL-valine and *N*-acetyl-l-cysteine

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EPR investigation of gamma-irradiated L-citrulline, α-methyl-DL-serine, 3-fluoro-DL-valine and N-acetyl-L-cysteine

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ABSTRACT

The spectroscopic parameters of the paramagnetic species produced in gamma-irradiated L-citrulline, α-methyl-DL-serine, 3-fluoro-DL-valine and N-acetyl-L-cysteine were investigated at room temperature at a dose of 20 kGy by using EPR technique. The paramagnetic species were attributed to $NH_2CONH(CH_2)_3\dot{C}NH_2COOH$, $HOCH_2\dot{C}CH_3COOH$ and $HO\dot{C}HCCH_3NH_2COOH$, $CH_3CH_3\dot{C}CHNH_2COOH$ and $SHCH_2\dot{C}NHCOCH_3COOH$ radicals, respectively. EPR data of the unpaired electron with the environmental protons and ^{14}N nucleus were used to characterize the contributing radicals produced in gamma irradiated compounds. In this paper, the stability of these compounds at room temperature after irradiation was also studied.

Keywords: EPR, free radicals, amino acid derivatives, gamma irradiation

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1. Introduction

The role of free radicals in the metabolism of the living organisms is well known in the literature [1]. Many diseases were found to be connected with free radicals [2]. Electron paramagnetic resonance is a very sensitive method for detection of free radicals. It can be used for a detailed study of radicals derived from amino acids and drugs which have unpaired electron [3-11]. This technique was also applied to irradiated foodstuffs for detection of free radicals produced by irradiation treatment in meat containing bone [12-17].

These selected compounds have not been studied before by electron paramagnetic resonance spectroscopy. Amino acids and their derivatives are biologically important organic substances. L-Citrulline is an ideal natural supplement that may help to prevent cancer, stroke,