

APPLICATION OF EPR SPECTROSCOPY TO EXAMINATION OF GAMMA-IRRADIATED AZITHROMYCIN

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Formation of free radicals during radiosterilization of azithromycin was studied by electron paramagnetic resonance (EPR) spectroscopy. Azithromycin is a semi-synthetic macrolide antibiotic effective against a wide variety of bacteria. It prevents bacteria from growing by binding to the 50S subunit of the bacterial ribosome which inhibits mRNA translation. This antibiotic is commonly administered in the form of tablets or oral suspension.

The aim of this work was to examine the influence of radiation dose on the amount of free radicals in gamma-irradiated azithromycin. Changes in free radicals system during storage time was tested. Samples of azithromycin were prepared in form of tablets, and they were irradiated with a ⁶⁰Co source. We used the following doses (kGy): 5, 10, 15, 20, and 25. First derivative spectra were measured with an X-band (9.3 GHz) electron paramagnetic resonance spectrometer produced by RADIOPAN (Poznań). The spectra were measured with microwave power in the range 0.7–70 mW. Complex EPR spectra were measured for gamma-irradiated azithromycin. Free radicals concentration increased with increasing radiation doses. The effect of storage time on the concentration and properties of free radicals in the preparations of the drug is discussed.