

FREE RADICALS INDUCED IN ARCHIVE PAPER BY IRRADIATION

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Irradiation of archive paper (document archives of institutions, companies etc. and library or museum collections of books and documents) can solve the problems related to the bio-deterioration and bio-contamination of paper and sometimes save valuable cultural heritage paper items. For valuable paper items care should be taken to the degradation induced instantly by the ionising radiation to the cellulosic support and also to the long term post-irradiation effects. The free radicals formed due to the irradiation treatment could contribute to instant degradation of paper. Part of them are also trapped for months and years after irradiation and they could be related to the post-irradiation effects in paper items. In this study, different sorts of cellulosic support samples (soft wood and hard wood cellulose, contemporary paper, paper from archives and from collections etc.) have been irradiated with dosis up to 100 kGy and the radiation induced free radicals have been measured by ESR spectrometry. The ESR signals have shown the type and quantity of radiation induced free radicals. Their study can be used for a reallistic estimation of the degradative effect of the ionising radiation treatment of archive paper.