



# Long-term side-effects of gamma-irradiation disinfection on some properties of archives

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## Summary

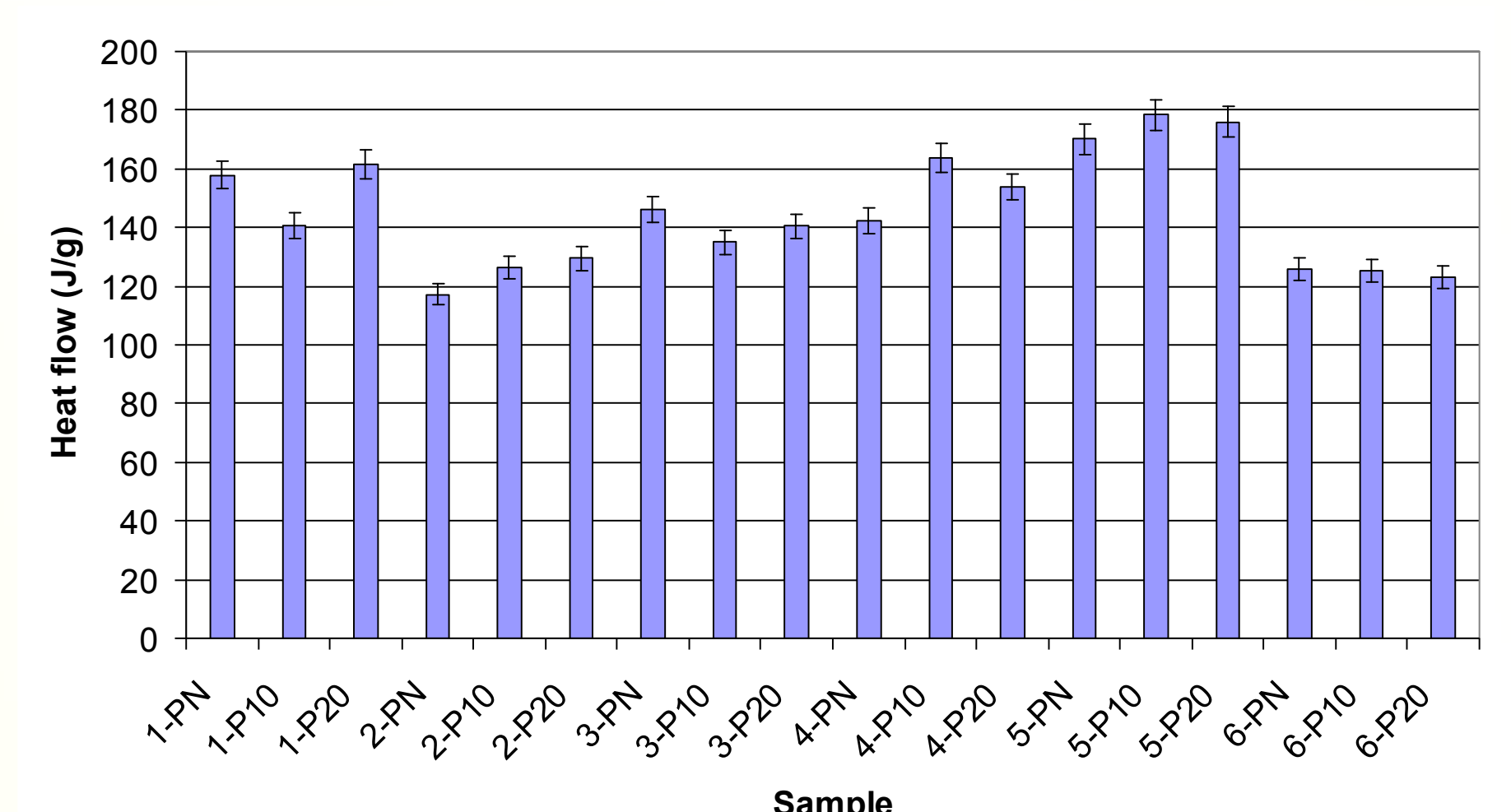
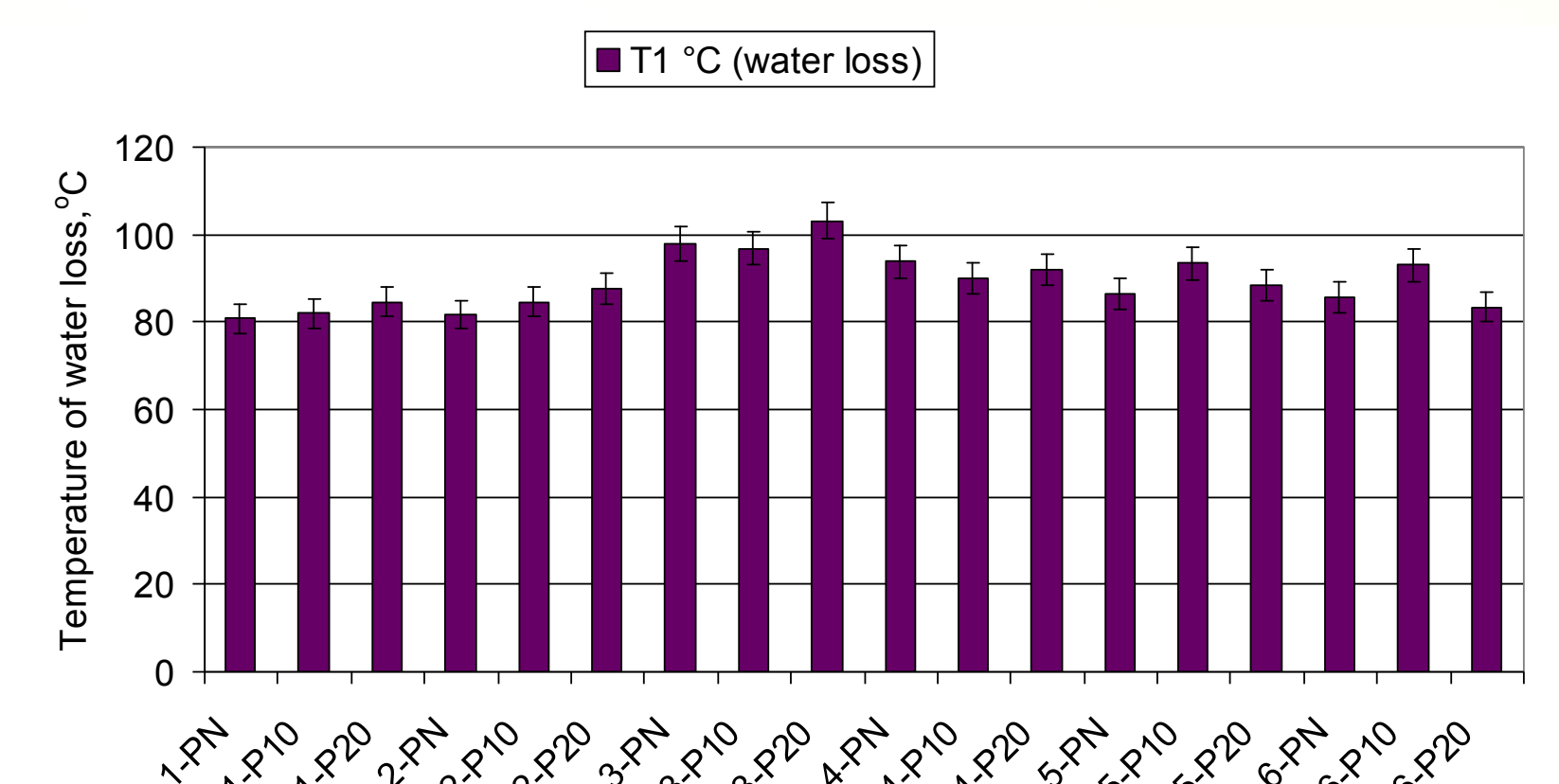
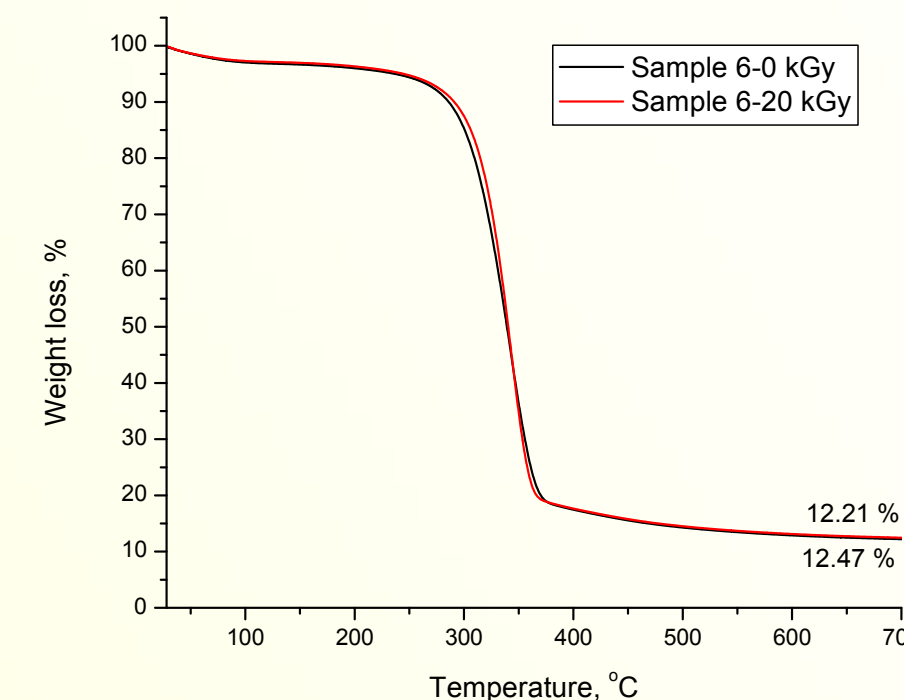
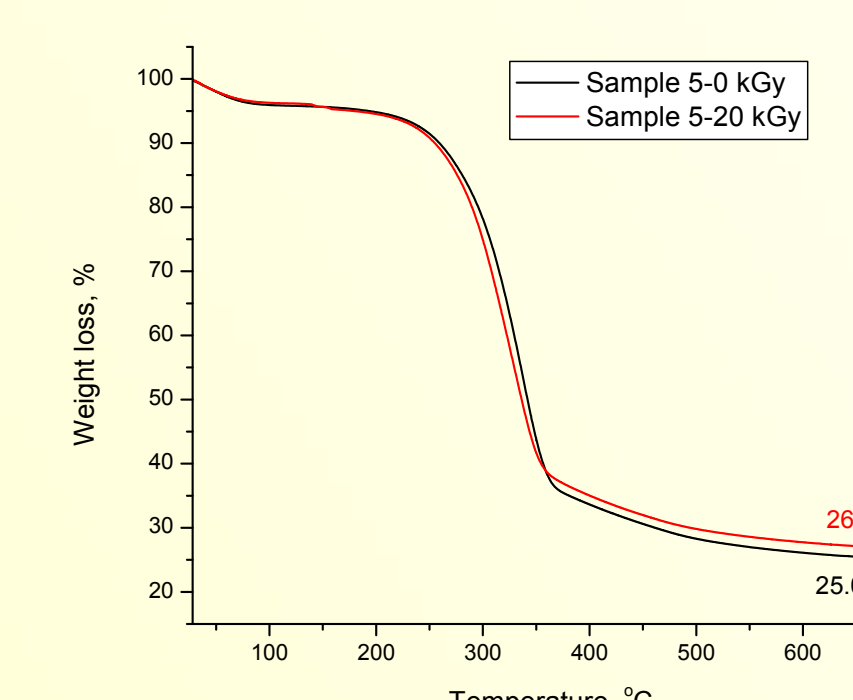
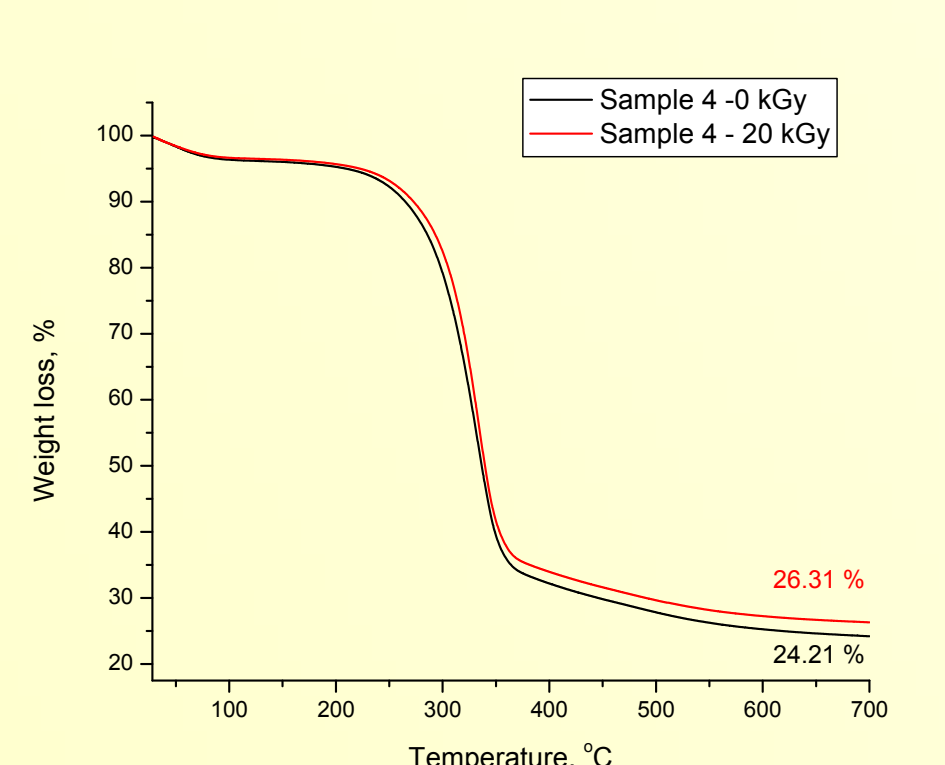
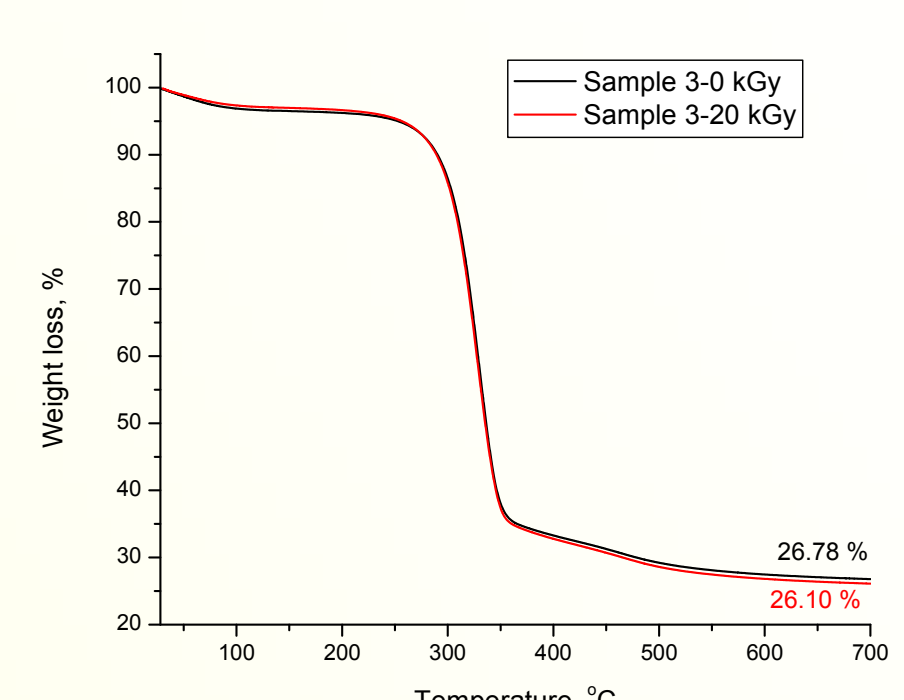
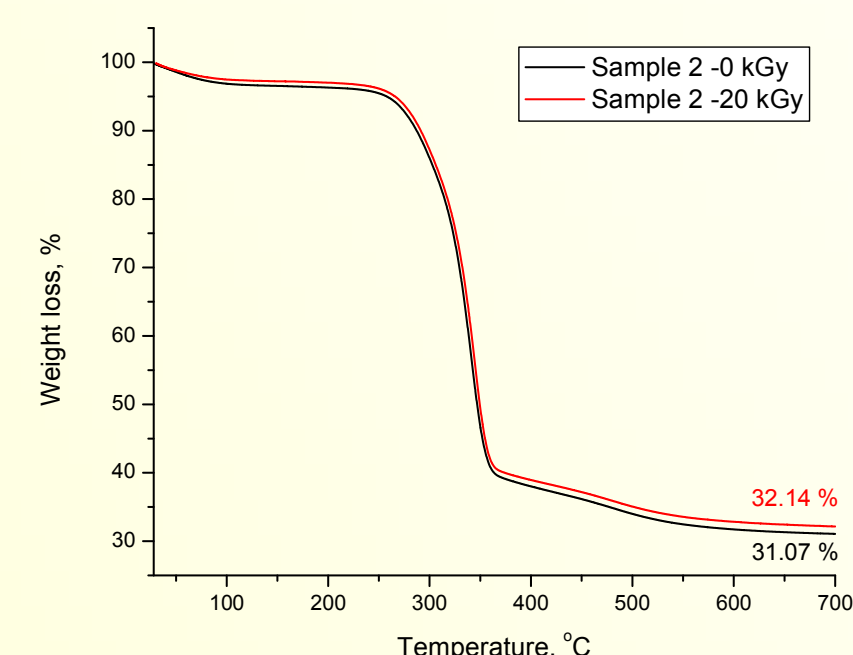
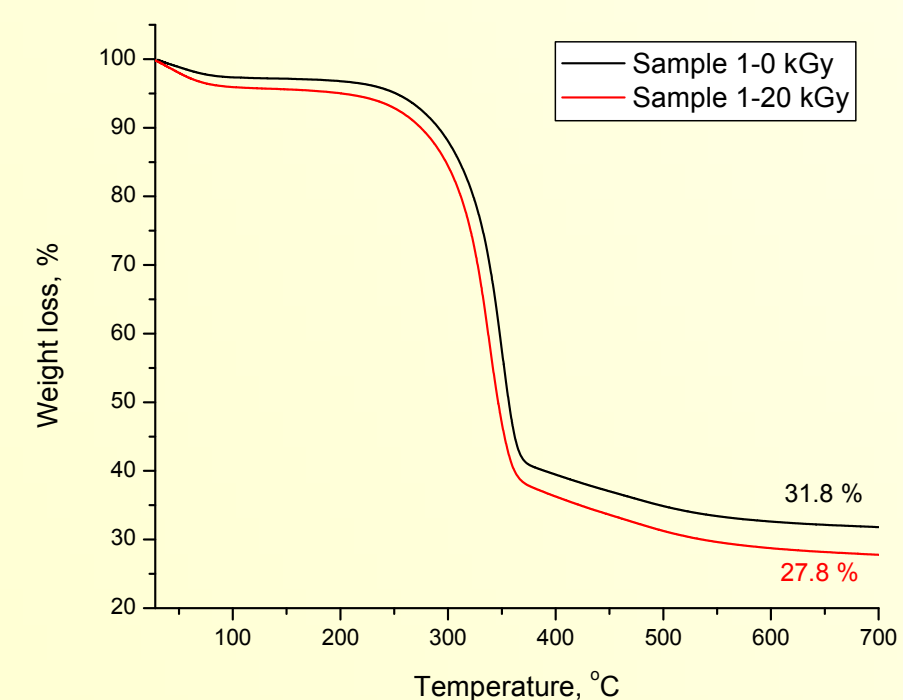
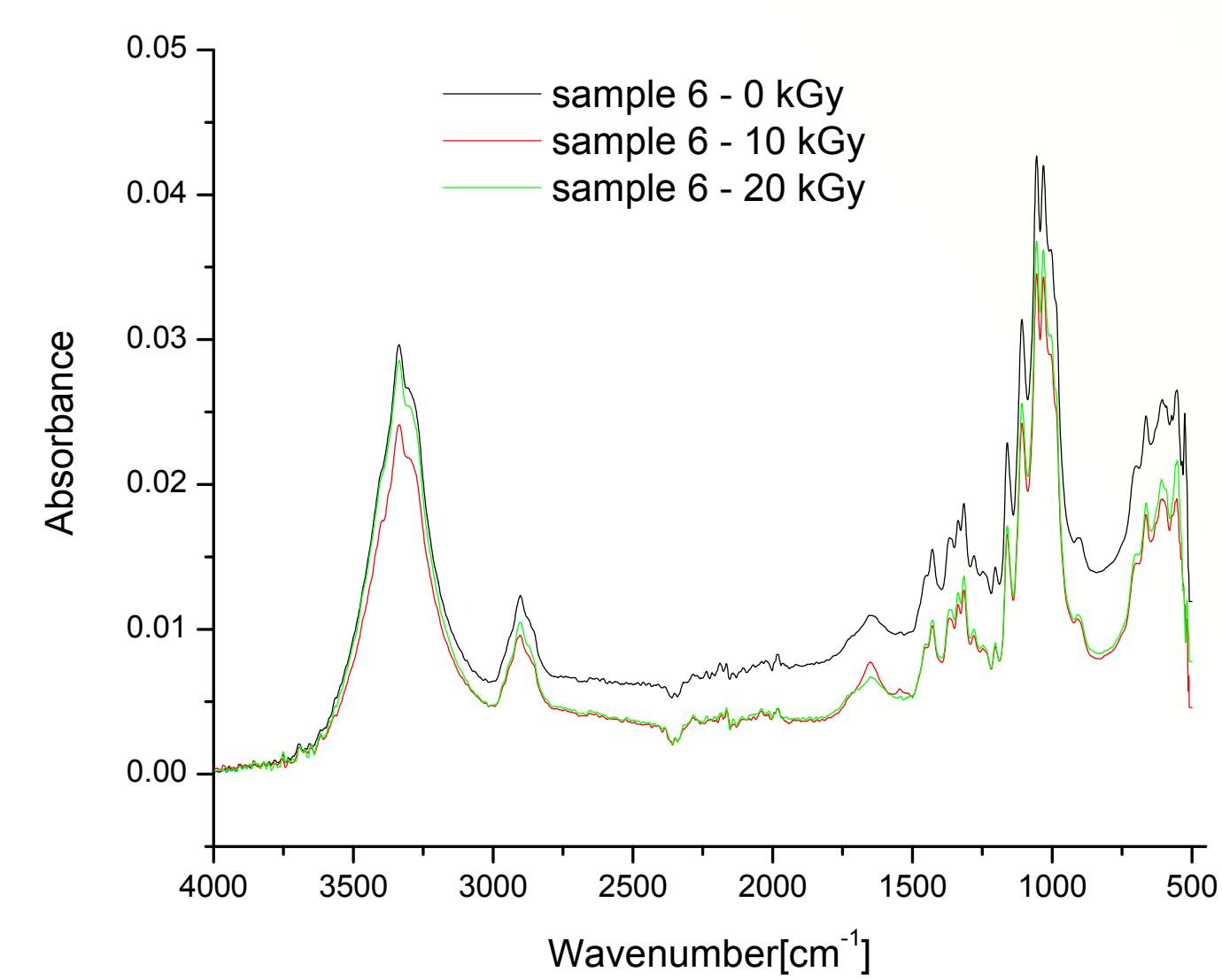
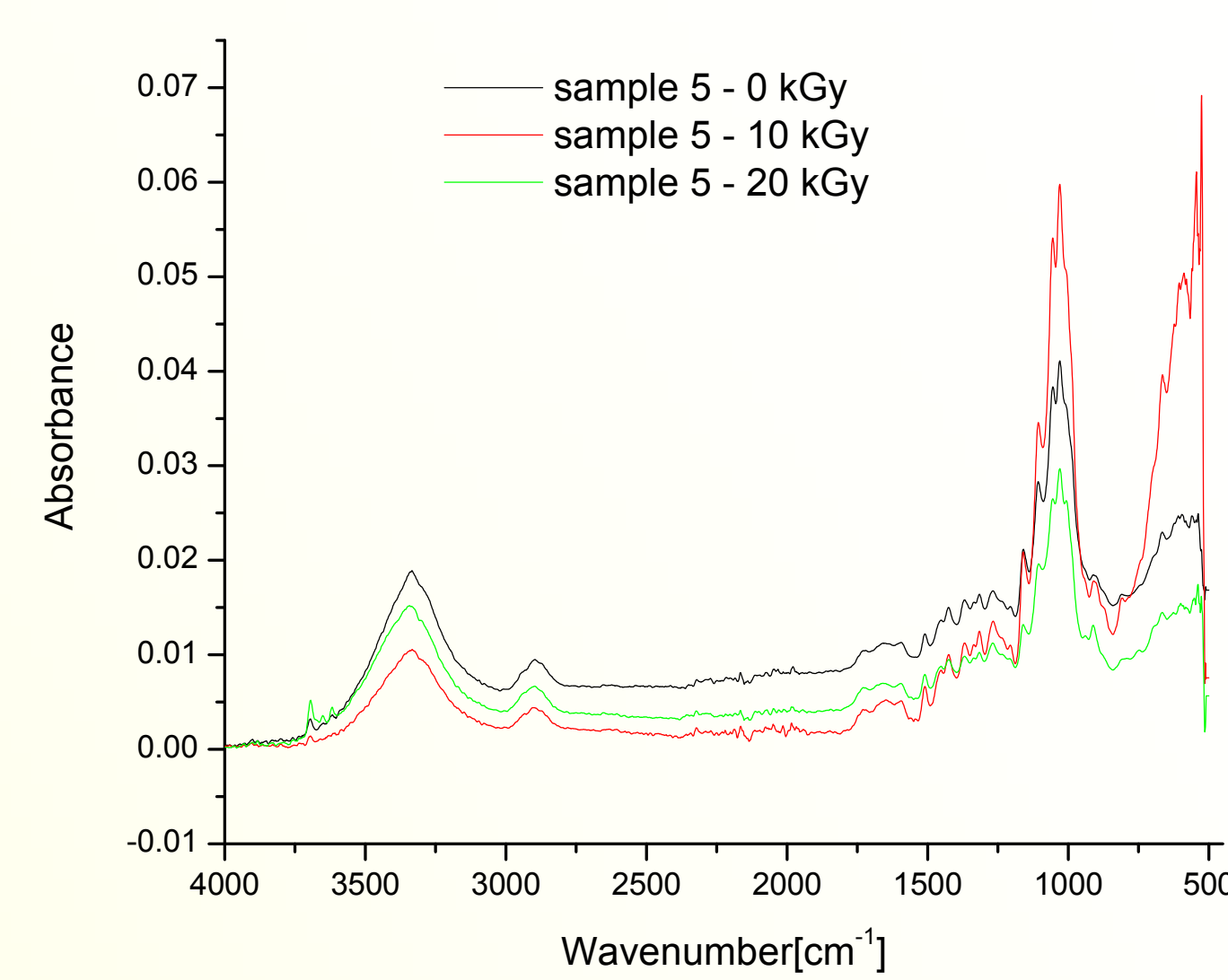
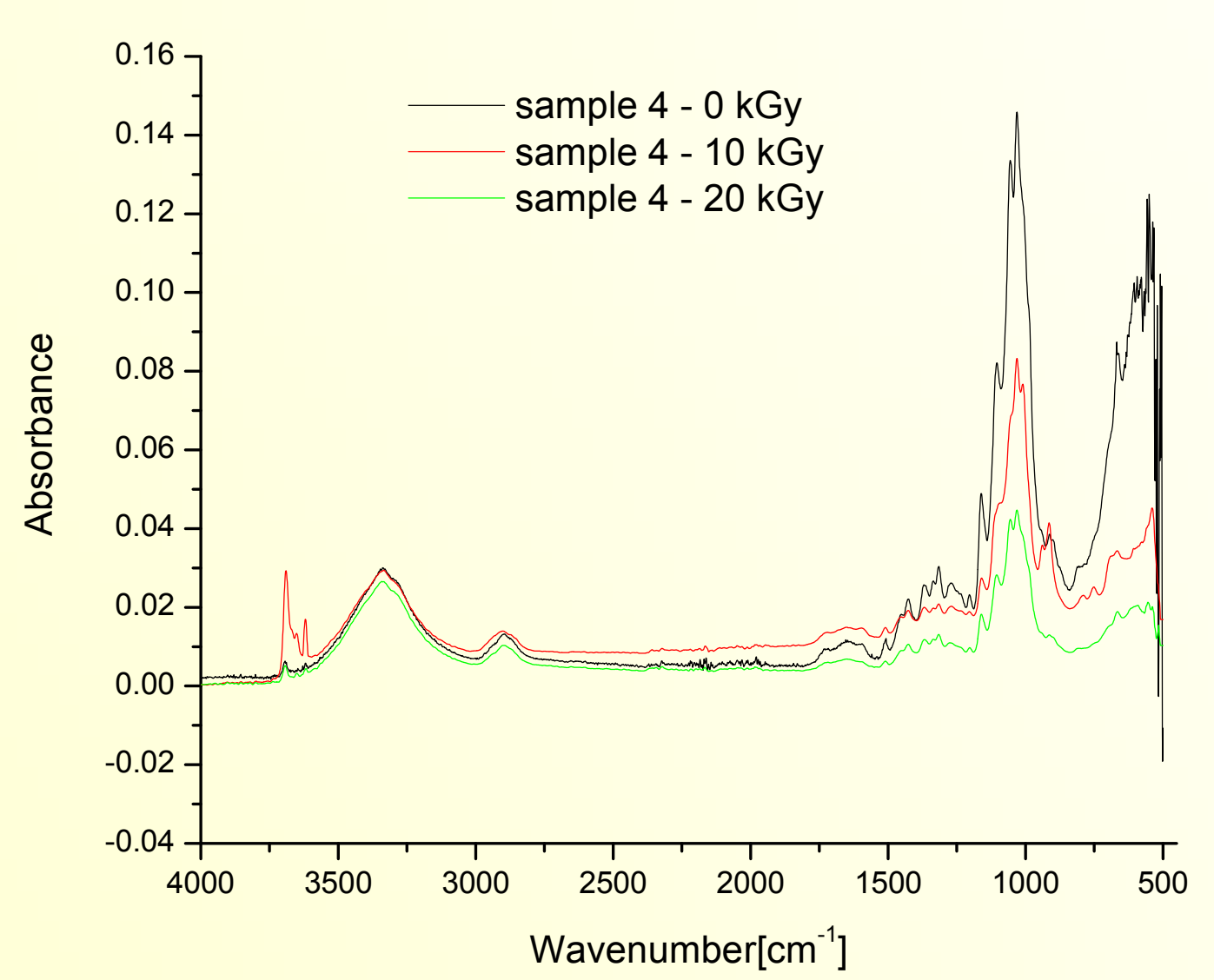
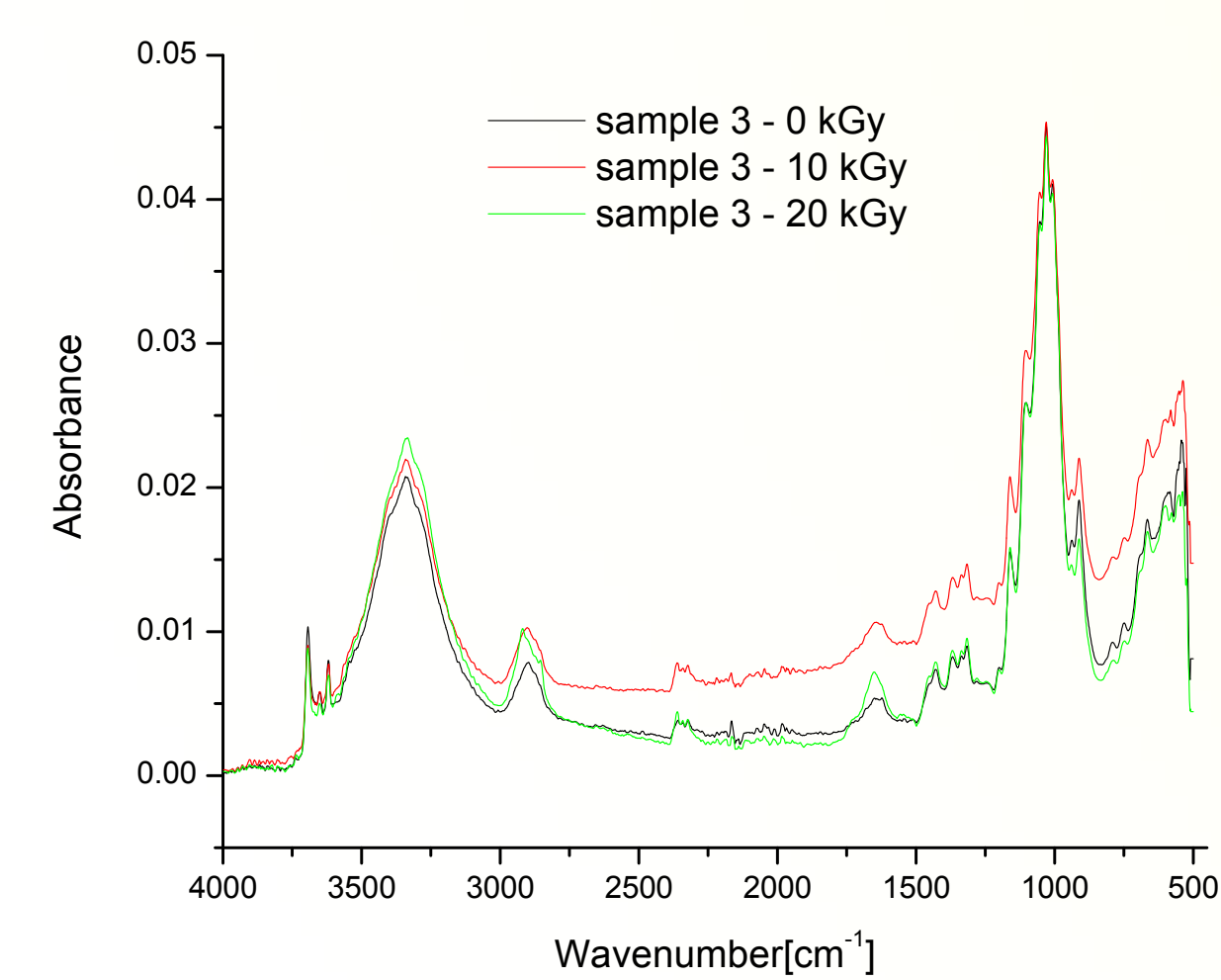
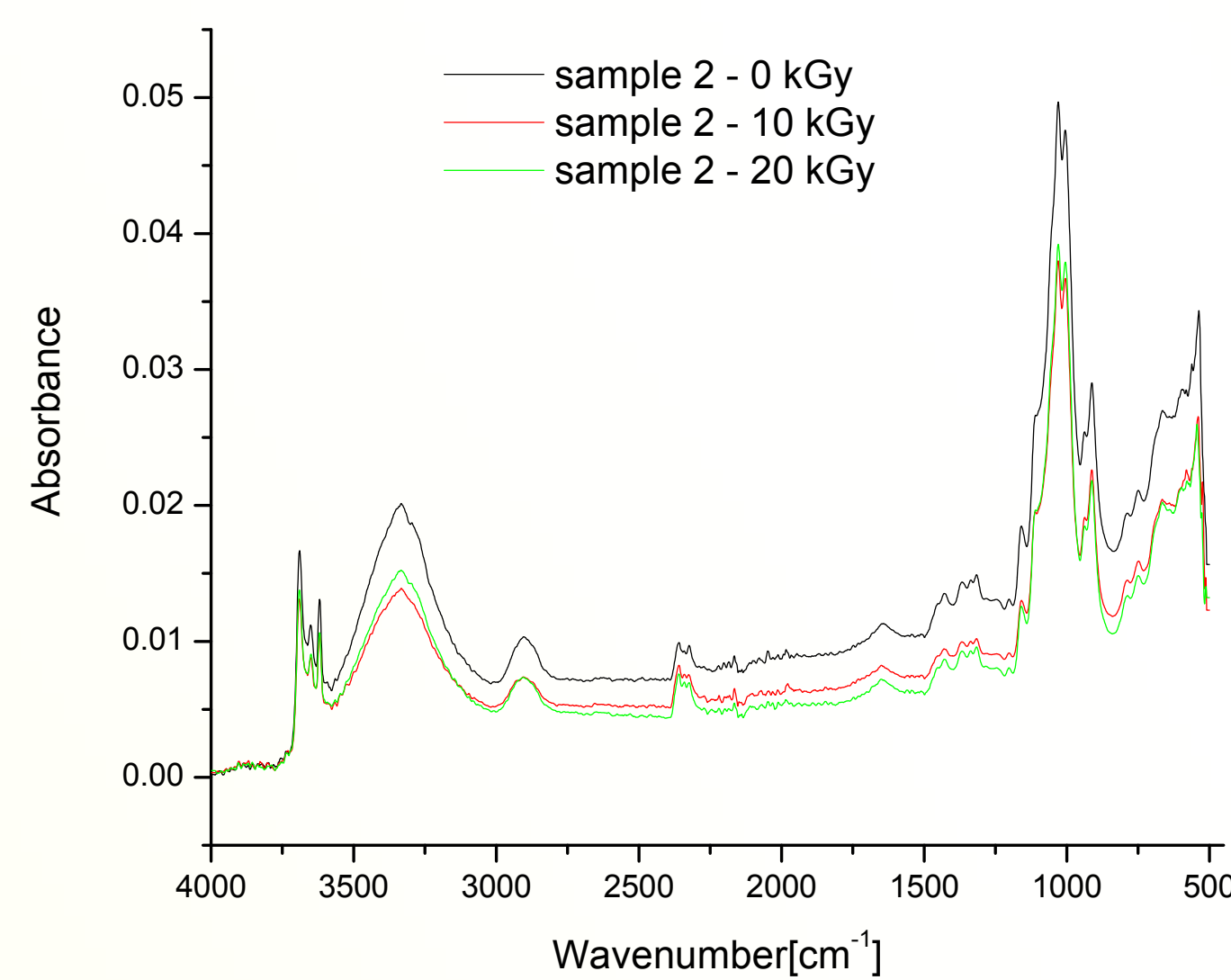
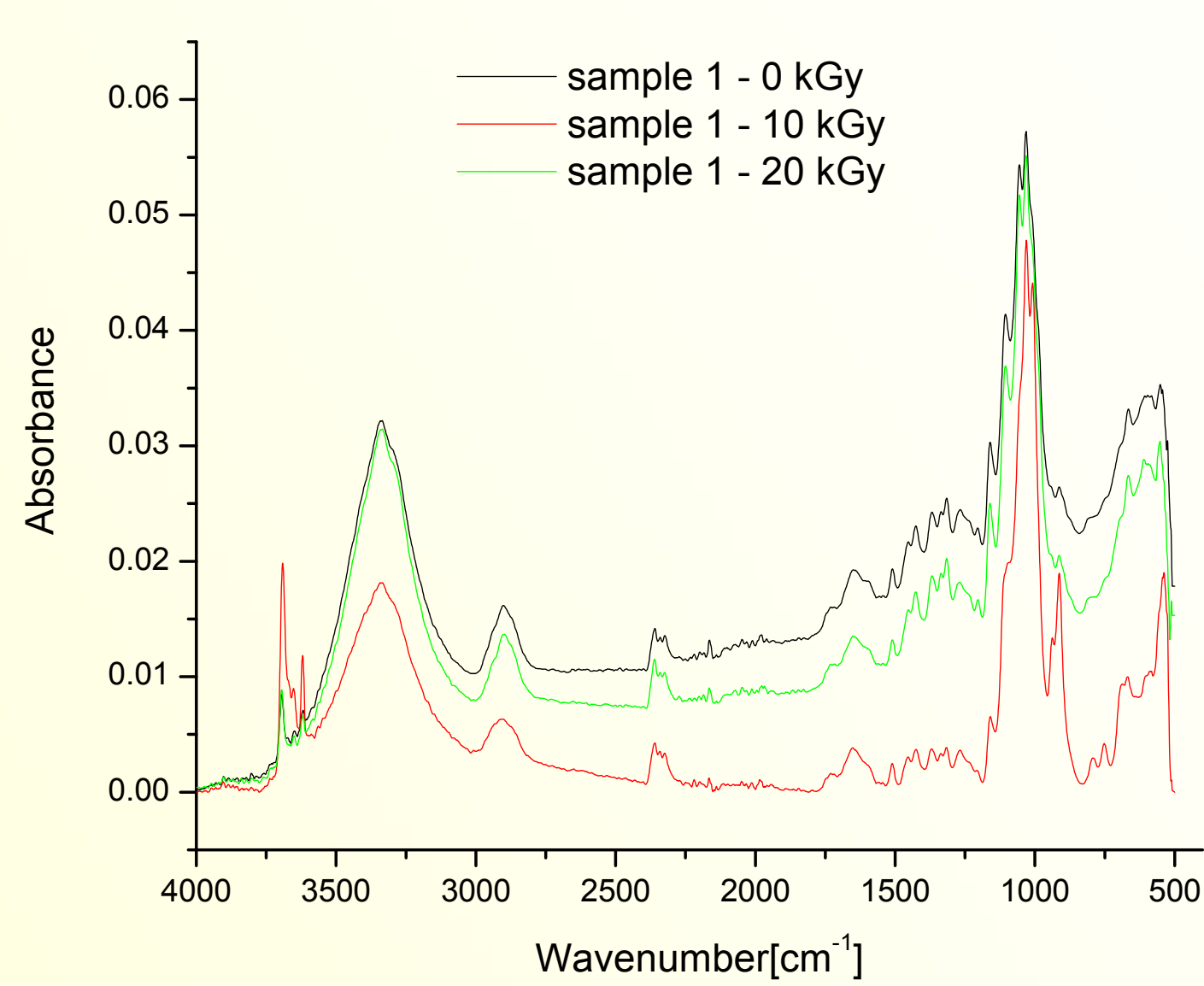
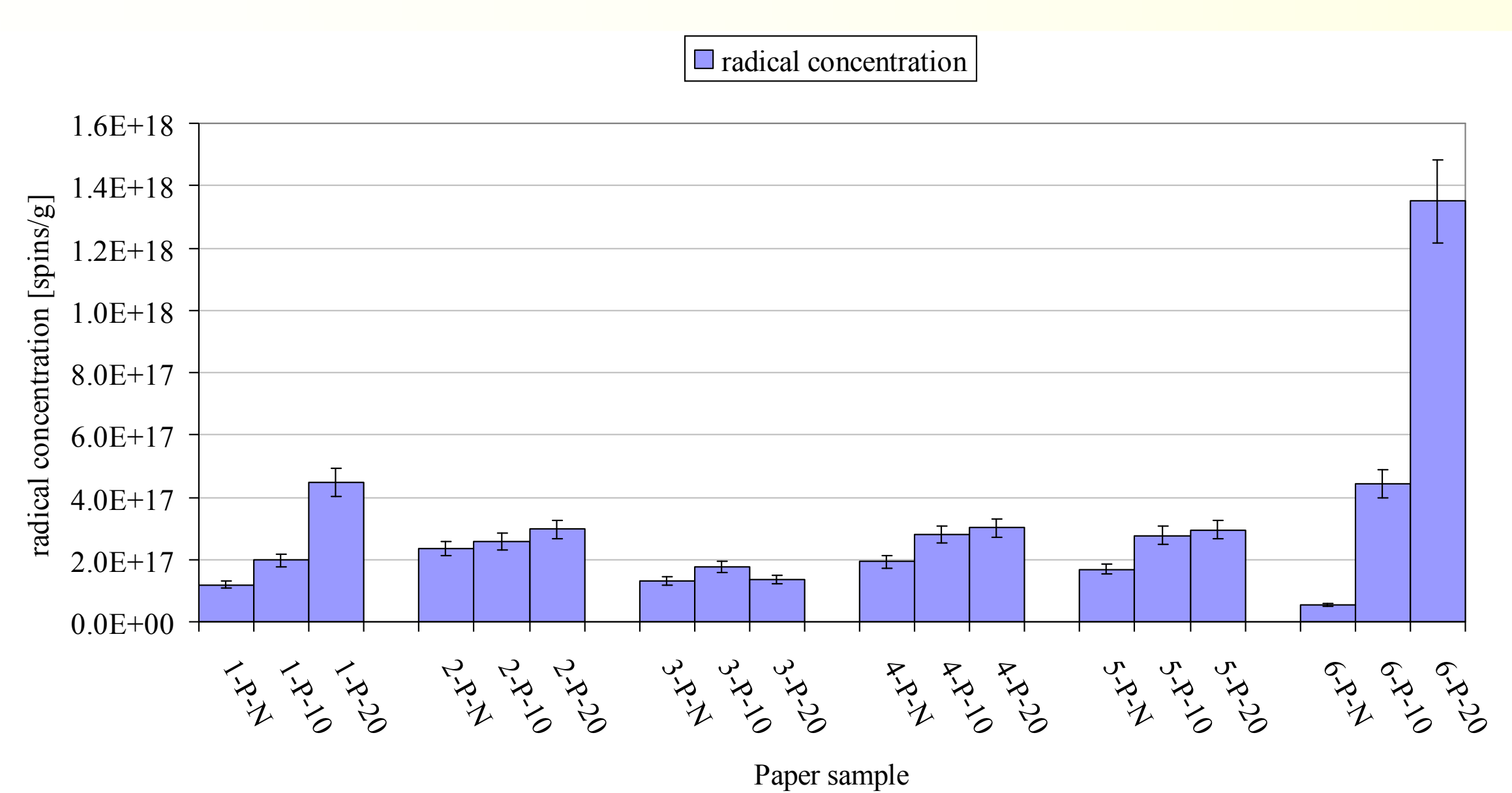
Gamma-disinfection is among the most efficient methods for preservation of biodeteriorated books and archive documents. The use of biocide effect of gamma-irradiation to stop biological aggressors has several advantages, as compared to the traditional chemical treatment, such as lack of toxic residues, higher effectiveness, reliability, applicability on large amount of objects etc. Although the recognized advantages of the gamma-irradiation processing for disinfections of archives, this technique is not regularly well accepted and routinely used in many countries with industrial irradiators. The main hesitations of librarians, restorators and conservators are provoked by the possible degradation effects of the ionizing radiation on the paper, especially at doses, aimed to inactivate fungal and bacterial attacks. The long-term side effects of gamma-irradiation are of special interest in order to evaluate the long-lasting consequences on the properties of the archives. Therefore studies on the effects of ionizing radiation on some properties of librarian archive from Sofia University in Bulgaria were carried out. This paper presents the long-term side effects of gamma-irradiation of books and journals by focusing on the radical formation, FT-IR and thermal degradation 4.5 years after the gamma-irradiation.

## Materials and methods

The paper samples, used in the present study were taken from six different issues, published in Germany, Russia and USA in the period from 1896 to 1962 years. Paper samples were individually packed in polypropylene bags. Each sample was gamma-irradiated with 10 kGy and 20 kGy absorbed doses, using radiation facility BULGAMMA based on JS-850 60Co type gamma irradiator of Sopharma JSC, Bulgaria. Analysis of non-irradiated and irradiated papers was performed by EPR, DSC and TG/DTG.

## Results and discussion

Sample №	Book description	Year of publishing	Country
1-PN	Periodical (Izvestija vuzov USSR)	1962	USSR
2-PN	Periodical (Chemical Abstracts)	1962	USA
3-PN	Reference book (Beilstein)	1942	Germany
4-PN	Periodical (Referativnij Zhurnal Khimija)	1952	USSR
5-PN	Monography	1923	Germany
6-PN	Periodical (Chemische Berichte)	1896	Germany



## Acknowledgements

This study was performed with the financial support of the International Atomic Energy Agency, Coordinated Research Project F23032, Research Contract № 20567.