

# Nanochemistry and biotechnology

## Comparison of spectral, light scattering and zigzag pattern analysis methods

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A comparison of zigzag pattern analysis method with UV absorption, fluorescence and light scattering methods was carried out. The results obtained for saline BSA solutions and films indicate that detection of chemical and physical factors' influence using zigzag analysis can be on par with other methods. The values in the tables (percentages) are provided relative to the control values.

Table 1. Substitution of Cl<sup>-</sup> with F<sup>-</sup> and Br<sup>-</sup>

[F <sup>-</sup> , Br <sup>-</sup> ]	F <sub>A</sub> <sup>-</sup>	F <sub>F</sub> <sup>-</sup>	F <sub>L</sub> <sup>-</sup>	Br <sub>A</sub> <sup>-</sup>	Br <sub>F</sub> <sup>-</sup>	Br <sub>L</sub> <sup>-</sup>
0%	100%	100%	100%	100%	100%	100%
20%	100%	100%	83%	100%	100%	112%
40%	100%	100%	57%	100%	100%	32%
80%	100%	100%	0%	100%	100%	0%
100%	106%	98%	0%	88%	88%	0%

Table 2. Temperature

T, °C	T <sub>F</sub>	T <sub>k</sub> , cm <sup>-1</sup>	T <sub>L</sub>
20–45	100%	0	100%
70	74%	431	35%
95	78%	709	0%

Table 3. Gamma irradiation

Dose, Gy	R <sub>A</sub>	R <sub>F</sub>	R <sub>D</sub>	R <sub>L</sub>
0–0.16	100%	100%	100%	100%
1–200	103%	83%	110%	42%
2000	150%	4%	170%	25%
12000	122%	0%	–*	1%

Subscripts:

A – UV absorption intensity (±10%)

F – fluorescence intensity (±10%)

L – specific zigzag length (±37%)

D – particle diameter (±30%)

k – fluorescence peak shift (±170 cm<sup>-1</sup>)

\* At this dose, protein solution becomes too polydisperse for DLS analysis.