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Sodium tartrate as ESR dosimetric material for low-dose measurement

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Potential ESR dosimetric application of different compounds of sodium tartrate such as sodium tartrate dihydrate (NaTA), sodium bitartrate monohydrate (Na-bTA), and potassium sodium tartrate tetrahydrate (KNaTA) were investigated in the range of 0.5 –50 Gy. Comparisons were also made with alanine (AL) [1], ammonium tartrate (AmTA) [2] and lithium formate (LiF) [3] samples. It is found that NaTA presents almost singlet ESR spectra with a shoulder at both sides of the singlet, while other compounds present more complex ESR spectra. From dosimetric point of view, NaTA has presented a better dose-response than other tartrate compounds (Na-bTA, KNaTA and AmTA) and AL. However NaTA has a good radiation dose response LiF has a slightly better response in the interested dose range. Nevertheless, the narrow linewidth of NaTA (~0.6 mT) makes it a good candidate to be used as a low-dose ESR dosimetric material [4].

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