Analysis of dosimetric properties of quartz crystals under gamma irradiation

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Abstract This study explored the thermoluminescence (TL) properties of various quartz types (amethyst, citrine, rock crystal, and rose quartz) when exposed to gamma irradiation, assessing their potential for dosimetric applications. Key aspects such as heating rate, glow curves, dose-response behavior, linearity index, sensitivity, and fading characteristics were analyzed for each quartz type. The results revealed significant differences in

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TL performance among the quartz samples, with each type exhibiting distinct characteristics under gamma irradiation. Amethyst displayed the most reliable TL behavior, with strong linearity and stable dose-response relationships, making it the most suitable candidate for radiation dosimetry. These findings contribute valuable insights into the selection of optimal quartz materials for radiation measurement, enhancing the precision and reliability of TL-based dosimetric techniques.

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