

عنوان مقاله:

Development of Lead-Free Materials for Radiation Shielding in Medical Settings: A Review

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خلاصه مقاله:

Radiation protection is an essential issue in diagnostic radiology to ensure the safety of patients, healthcare professionals, and the general public. Lead has traditionally been used as a shielding material due to its high atomic number, high density, and effectiveness in attenuating radiation. However, some concerns related to the long-term health effects of toxicity, environmental disease as well as heavy weight of lead have led to the search for alternative lead-free shielding materials. Lead-free multilayered polymer composites and non-lead nano-composite shields have been suggested as effective shielding materials to replace conventional lead-based and single metal shields. Using several elements with high density and atomic number, such as bismuth, barium, gadolinium, and tungsten, offer significant enhancements in the shielding ability of composites. This review focuses on the development and use of lead-free materials for radiation shielding in medical settings. It discusses the drawbacks of traditional lead shielding, such as toxicity, weight, and recycling challenges, and highlights the benefits of lead-free alternatives.

کلمات کلیدی:

Radiation protection, Radiation, Radiography, X-rays, Lead-Free Shields, Multilayered Polymer Composites, Nano-Composite Shields

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