

X-ray protective materials from barium sulfate/amorphous cellulose/natural rubber composites

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รายละเอียดสรุป

This research developed the X-ray protective materials using barium sulfate/amorphous cellulose (Ba/AC) incorporated with natural rubber. The Ba/AC was prepared from the in-situ regeneration process of amorphous cellulose from eucalyptus pulp and office waste paper using barium chloride. The shielding sheets were prepared by mixing vulcanization natural rubber individual with Ba/AC from office waste paper (NR-W) and purified eucalyptus pulp (NR-E), including compared with the barium sulfate powder (NR-P) as conventional material. The NR-W and NR-E were shown the predominant attenuation compared to the NR-P. The amorphous cellulose surrounded barium sulfate plays a role in distributed and reduced the aggregation of the particle. The behavior results in most incident X-rays have absorbed effectively. Subsequently, the prototypes were fabricated from the NR-W and NR-E at the equivalent of 0.25 mm Pb, complying with the recommendation for patients and occupational workers. The protective materials were produced for preventing the primary radiation comprising head shield, thyroid shield, and breast shield. The lab coat was also prepared to block the scatter radiation. In summary, the X-ray shielding prototypes present the benefits of biodegradable, eco-friendly, cost-effective, and non-toxic.

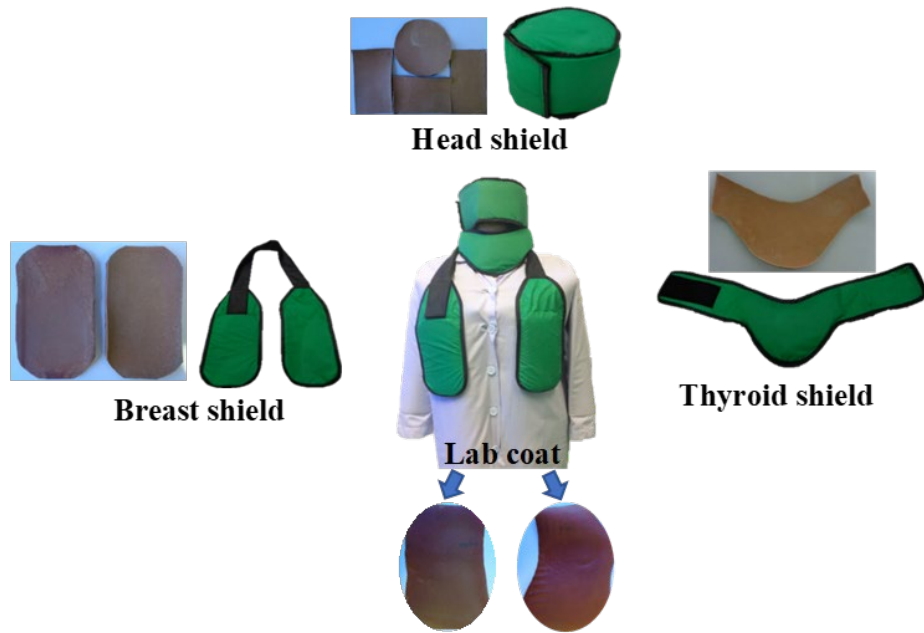


Fig. 1. The X-ray protective prototypes equivalent to 0.25 mm Pb.