



The Development of Barium-Resin Composites for Radiation Protection from Kilovoltage X-ray Machine

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Introduction: In this paper shows the experiment and research for the appropriate ratio development of Barium sulphate and Resin to protect hazards from radiation leakage of the kilovoltage-level x-ray machine. The objective is to reduce the cost in the Radiology Department in hospitals.

Purpose: This study shows the experimental and research for the appropriate ratio development of Barium sulphate and Resin to protect hazards from radiation leakage of the kilovoltage-level x-ray machine.

Methods: The equipment were used to research consist of Barium Sulphate, Resin, ten centimetres square-mould, Thermometer, Thermo Hygrometer, kilovoltage-level x-ray machine, Radiation detector and computer. The 6 Barium-Resin composite materials which divided into three parts consist of two for each part according from the ratio of Barium and Resin which are 60:40, 70:30, and 80:20 are measured about the penetration of x-rays to analyze linear attenuation coefficient of each composite material.

Results: The Barium-Resin composite material of 60:40 can absorb the radiation more than the Barium-Resin composite material of 70:30 because of the amount of tiny air bubbles in the material. There is a little amount of bubble in Barium-Resin composite material of 60:40. So, it can be more efficient to absorb the radiation, but less efficient from 80:20. The Barium-Resin composite material of 70:30 is less efficient when compared to the others because the air bubbles. The Barium-Resin composite material of 80:20 is the best in term of radiation absorption (attenuation).

Conclusion: In conclusion, when use the result from this research in order to reduce the cost in radiology department, the ratio of Barium and Resin to cover some part of the wall that was broken and be the cause of radiation leakage. So, the ratio combination of the Barium and Resin is the best alternative would be Barium-Resin composite material of 60:40 according to the amount of the Barium sulphate is enough to cover the wall for the kilovoltage-level x-rays machine.

Keywords: Barium Sulphate / Resin / Radiation Protection

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