BMT-62266 DIAGNOSTIC X-RAY IMAGING TECHNIQUES

Examination, November 27th, 2018

By which methods the beam obtained from the X-ray tube is processed before hitting the detector?

2. Which photon interaction mechanisms are essential when an X-ray imaging beam hits the tissue at different energy levels?

3. What is the principle of dual energy CT device can be realized?

4. For 20 pm X-rays, the mass absorption coefficients \( \mu_m \) (2) in cm²/g for several metals are: aluminium, 0.270; copper, 1.55; and lead 4.90.

   a) What is the half-value thickness of each for narrow beam of X-rays?

   b) What thickness of each is required to reduce the intensity of the transmitted beam to 1/32 of its incident value?

   c) If the "build-up" due to scattering and other processes for a broad beam of radiation is equivalent to making the incident beam 1.5 times its actual intensity, what thickness of each material is needed to obtain an intensity reduction to 1/32?

   \[ \rho(Al) = 2.70 \text{ cm}^3/\text{g}, \rho(Al) = 8.96 \text{ cm}^3/\text{g}, \rho(Al) = 11.35 \text{ cm}^3/\text{g} \]