

(15.4) With the information in exercise 15.1, calculate annual doses received from (a)  $^{40}\text{K}$ , and (b)  $^{226}\text{Ra}$  and daughters. Assume  $w_R(\alpha) = 20$ .

$$t_{irr} := 1 \cdot yr \quad m_{body} := 70 \cdot kg \quad Gy := \text{joule} \cdot kg^{-1} \quad Sv := \text{joule} \cdot kg^{-1} \quad \mu Sv := 10^{-6} \cdot Sv$$

$$R_{40K} := 4.398 \cdot 10^3 \cdot sec^{-1} \quad E_{40K} := 6.25 \cdot 10^{-14} \cdot \text{joule} \quad D_{40K} := t_{irr} \cdot R_{40K} \cdot E_{40K} \cdot m_{body}^{-1}$$

$$R_{226Ra} := 0.925 \cdot sec^{-1} \quad E_{226Ra} := 4.689 \cdot 10^{-12} \cdot \text{joule} \quad D_{226Ra} := t_{irr} \cdot R_{226Ra} \cdot E_{226Ra} \cdot m_{body}^{-1}$$

$$D_{40K} = 1.239 \cdot 10^{-4} \cdot Gy \quad H_{40K} := 1 \cdot D_{40K} \quad H_{40K} = 123.917 \cdot \mu Sv$$

$$D_{226Ra} = 1.955 \cdot 10^{-6} \cdot Gy \quad H_{226Ra} := 20 \cdot D_{226Ra} \quad H_{226Ra} = 39.106 \cdot \mu Sv$$

Answers:

(a) 124  $\mu\text{Sv/y}$

(b) 39  $\mu\text{Sv/y}$