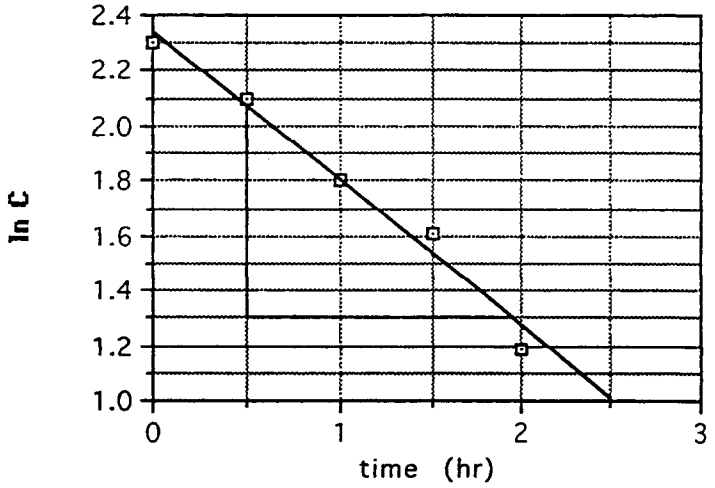
7.43 Starting with (7.61) and using the special conditions of this tracer-gas study; that is, a conservative tracer (K=0), no tracer in the air leaking into the room (C_a=0), and the tracer source turned off at t=0 (S=0) gives the exponential decay of tracer as:

$$C(t) = C_0 e^{-It}$$

$$\ln[C(t)] = \ln(C_0) - It \quad \text{which is of the form}$$

y=mx + b, where y = lnC, m=I, and b=lnC_o

time (hr)	C (ppm)	ln C
0	10.0	2.303
0.5	8.0	2.079
1.0	6.0	1.792
1.5	5.0	1.609
2.0	3.3	1.194



From the graph, the slope is about: $\text{slope} \approx \dfrac{(2.1-1.3)}{2.0-0.5} = 0.53$

Thus, the infiltration rate is about 0.53 air changes per hour.

7.44 Infiltration 0.5ach, 500m^3 volume, 200 m^2 floor space, radon 0.6pCi/m^{2}s:

Using (7.60) with K=7.6x10^{-3}/hr (Table 7.15),

$$S = \frac{(S/V)}{I+K} = \frac{\left(0.6\,\text{pCi/m}^2\text{s} \times 200\text{m}^2/500\text{m}^3\right)}{\left(0.5/\text{hr} + 7.6\text{x}10^{-3}/\text{hr}\right)\text{x}\dfrac{1\text{hr}}{3600\text{s}}} = 1700\,\text{pCi/m}^3 = 1.7\,\text{pCi/L}$$