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CALCULATION OF EXPOSURE AND CONCENTRATION IN SI UNITS

The integrated exposure (E) in Bq-days/m³ is calculated from the gross track count (R_T), the background track count (R_b), the exposure conversion factor (ECF), and the correction factor for overlapping tracks (τ) due to high track counts resulting from high exposures.

$$E = ECF \left(\frac{R_T - R_b}{1 - (\tau * R_T)} \right)$$

Where:

E = the exposure in Bq-days m⁻³,

ECF = the exposure conversion factor - sheet dependant, typical = 733 Bq-days m⁻³ /tracks mm⁻²

R_T = gross tracks mm⁻²,

R_b = background tracks mm⁻², and

τ = overlap correction factor = 0.0043 mm² track⁻¹.

For low track densities, the above equation simplifies to:

$$E = ECF \times R_T$$

The concentration (C) in Bq/m³ is calculated From E and the exposure interval, d days.

$$C = E/d$$

or

$$C = ECF \left(\frac{R_T - R_b}{(1 - (\tau * R_T))d} \right)$$