

Gamma Template Sheet Notes

Values Specific to Each Detector

- Where did they come from?
 - o Intensity, Ke0, Ke1, Ks0, Ks1, blank, sigma

Important Definitions for Values

- Cpm = counts per minutes
- Dpm = disintegrations per minute (how many photons are emitted from ionization of radioactive material)
- Intensity
 - o Energy per unit time per unit area → Intensity of gamma rays decreases with distance from gamma source because rays are spread over greater area as distance increases.
 - Energy varies with distance from source is what intensity captures.
 - o Proportional to the corrected count rate (actual count rate minus background count rate; AKA count rate of excess Pb-210 (atmospherically derived Pb-210 from Ra-222, not in-situ Ra-226).
 - o $I = E/4\pi x^2$ or simply as $I \propto 1/x^2$
- Ke0
 - o Attenuation Coefficient?
- Ke1
 - o Attenuation Coefficient?
- Ks0
 - o Fitting coefficient for capturing drift.
- Ks1
 - o Fitting coefficient for capturing drift.
- Blank
 - o Gamma-ray spectrum or gamma emitted from polyethylene capsule.
 - o I'm guessing how much gamma radiation the container is contributing to the count values?
- Sigma
 - o Standard Deviation
- Efficiency
 - o "Efficiency (E) is computed by dividing the measured net counting rate* in counts per minute (CPM) by the sample's activity in decays per minute (DPM). This will yield a fraction that is less than 1; the detector only counts some of the radiation that is given off by the source."
 - o Detection efficiency → How much radiation the detector counts out of the total radiation given off by the source.
 - o Measured by
 - o In spreadsheet: $Ke1 - Ke0 * (\text{mean soil height} - 2.8)$
- SA corr
 - o Calculated from $Ks1 - Ks0 * (\text{mean soil height} - 2.8)$