

ORNL INSTRUMENT EVALUATION SUMMARY

SAIC Model AP-2 Alpha Analyzer

Description: The SAIC Model AP-2 is a hand held alpha contamination measurement device that has the capability of performing scans, and spectral analysis.

Ranges Evaluated: Auto ranging, scan mode

Report Date: February 6, 2001

General Comments:

1. Confidence intervals used to ascertain whether results are conclusive or inconclusive are determined using the 0.95 quantile of the student's t distribution (95% confidence interval).

RADIATION RESPONSE

Probe Surface Sensitivity: Not performed

ELECTRONIC and MECHANICAL REQUIREMENTS and TESTS

Line Noise: N/A

INTERFERING RESPONSES TEST RESULTS

Radio Frequency/Microwave: Substantial susceptibilities were indicated from approximately 210 to 660 MHz during the scan from 100 kHz to 1000 MHz at 20 (+10,-0) volts/meter. Susceptibility was indicated by increased response. Specific results and frequencies are available upon request.

Electric Fields: Not performed.

Magnetic Fields: No response abnormalities were observed when exposed to a 10 Gauss DC field and 60 Hz (1.26 Gauss) AC field in two orientations.

Interfering Ionizing Radiations: Each instrument was exposed to interfering radiation fields of 1 R/hr photon (Cs-137), 1 rem/hr neutron (Cf-252), and 0.5 rad/hr beta (Sr/Y-90). Measurements were made with an alpha source in place. All instruments responded to all three interfering radiations with the highest sensitivity being to beta radiation. Actual response data is available in the test report.

ENVIRONMENTAL FACTORS

Temperature: Susceptibilities were indicated during exposure to temperatures from -10 to 50 °C (+14 to 122 °F). These susceptibilities included loss of display (+50 C), out-of-tolerance confidence interval values, shut down. It was later observed that the shut down may have been caused by weak batteries although no indication of battery failure was observed. Additional information is available upon request.

Temperature Shock: Susceptibilities were indicated when exposed to rapid temperature changes from 22 to -10, -10 to 22, 22 to 50, and 50 to 22 (°C). They included out-of-tolerance confidence interval values, and loss of display (cold and hot extremes after equilibrium). Additional information is available upon request.

Humidity: Both instruments tested had acceptable results when exposed to a relative humidity level of 95% (non-condensing) for eight hours, and upon return to 40% for 4 hours at 25 ± 2 °C.

Vibration: Not performed.