IRPA9
1996 International Congress on Radiation Protection
April 14-19,1996
Vienna, Austria

FORM FOR SUBMISSION OF ABSTRACTS
(Instructions for preparation on reverse)

PAPER TITLE   AN ENVIRONMENTAL DOSIMETRY SYSTEM UTILIZING HYPER-SENSITIVE MATERIAL AND HOT AIR HEATING

AUTHOR(S) NAME(S)   R. A. Tawil, K. J. Velbeck, J. E. Rotunda, M. Moscovitch

SUBMITTING AUTHOR

LAST NAME VELBECK   FIRST NAME Kenneth J.   TITLE Group Leader Dosimetry

AFFILIATION BICRON NE   TEL 216/349-6960 ext. 6323

STREET   6801 Cochran Road   FAX 216/349-7442

CODE   CITY SOLON, OH 44139   COUNTRY USA

PRESENTING AUTHOR (IF DIFFERENT)

MAJOR SCIENTIFIC TOPIC NUMBER .4.1. (see page 7)

ABSTRACT (See instructions overleaf)

A completely portable and self-contained environmental dosimetry system, based on proven hot-gas TLD technology and enhanced with hyper-sensitive TL material, neural network dose computation, and requiring only electrical power for operation is presented and performance testing is discussed. The dosimeter is composed of a symmetric holder containing proper filtration to measure $Hp^*(10)$, $Hp^*(0.07)$ and discriminate low, intermediate and high energy environmental radiation. The TLD material is newly developed LiF:Mg,Cu,P mounted on Kapton® or sandwiched between Teflon® sheets. The new TLD material is tissue equivalent and is shown to be well suited for enviromnental dosimetry with higher sensitivity, more uniform response with respect to energy, and negligible fade. The TLD Workstation is equipped with an Air Supply Unit and provides portable field readout capability. The workstation is composed of a TLD reader, associated application software system, and a personal computer. The workstation software provides instrument control, data acquisition and storage, QC monitoring, and dose calculation algorithm. A new aspect of QC monitoring is the glow curve analyzer, which provides automatic screening to identify abnormal glow curves. The recently developed neural network-based algorithm computes the desired dose quantities more accurately than a simple dosimeter reading or a decision tree dose algorithm. This environmental dosimetry system was designed to comply with the current ICRP requirements and the proposed ANSI requirements.