APPLICATIONS OF CdTe TO NUCLEAR MEDICINE

by

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BROOKHAVEN PATENT GROUP

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Gerald Entine, President
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The use of CdTe radiation detectors in medical applications continues to become more widespread. During this contract period a CdTe detector as small as $3 \text{ mm}^3$ was inserted into a bronchoscope while a CdTe array as large as $4200 \text{ mm}^3$ was used as a prototype gamma camera.

Portable battery powered instrumentation has also been developed to further enhance the versatility of the CdTe concept. Figure 1 shows one of these electronic packages which is used in several hospitals. The unit provides an LED digital readout and timing circuits to vary the measuring time between 1 and 500 seconds. The total weight is below 0.6 Kg.

The units have been used with several specialized CdTe probes including a plutonium wound probe, a nuclear dentistry probe, an implantible heart probe and an I-125 Fibrinigen sensor. Most of these applications will be submitted by the medical groups for Publication within the next 12 months. Figure 2 illustrates several of these special probes.

As part of this report, we include a paper presented at the Nuclear Science Symposium (Oct. 1978) and published in the IEEE Transactions on Nuclear Science February 1979). This paper drew wide attention for both the use of CdTe and the new image reconstruction concept.

During the next year, several important CdTe projects in medicine should come to fruition. These include two cerebral blood flow imaging systems, a cancer probe for use in spinal surgery, a cardiac output monitor, and a study of pancreatic function. A review of many of these applications is being submitted by us to the Society of Nuclear Medicine and to other journals as a continuing effort to disseminate the technical information about the uses of CdTe detectors in medicine.
Fig. 1 - Portable CdTe Timer-Scaler
Fig. 2 - CdTe Medical Probes
Some of the recently published papers describing the uses of our CdTe in medicine are listed below;

These publications are quite effective and have had a significant impact on releasing the benefits of the CdTe technology research previously sponsored by the AEC. Considering that the research investment was well over two million dollars, the small program to disseminate the results to the medical community is a very cost effective activity.

Bibliography


Applications of CdTe to nuclear medicine. Annual report, I.

76-C-02-2541

*30Dep. NTIS, PC A02/MF A01

and Safety

530EDB;ERA;NTS;INS

United States of America (USA) 570United States

700950 8847 710Radiation Monitoring Devices,

URANIUM;RADIATION DETECTORS;C1;ELUTONIUM;PROBE

EMITTING DIODES;

MEDICINE;RADIATION DETECTORS

DETECTORS

CdTe radiation detectors in medical application. CdTe detector as small as 1 mm³ was inserted as a prototype gamma camera. Portable battery operated. The versatility of the CdTe concept. One of the treated. The unit provides an LED digital readout over 10 seconds. The total weight is below 0.6 g. The plutonium wound probe, a nuclear dentistry... These special probes are also illustrated.