Development of a primary standard for absorbed dose to water from alpha-emitting radionuclides
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Matriculated Fall 2018
Currently, there is a lack of traceability of absorbed dose to water in targeted alpha therapy (TAT). An absolute dosimeter is needed to directly measure absorbed dose from alpha-emitting radionuclides. Such a dosimeter can be used to determine a source-specific calibration coefficient (Gy/Bq) or can be used to validate commercial dose calculation softwares. Therefore, the goal of this work is to consider extrapolation chambers (EC) as primary standards for absorbed dose to water from alpha-emitting radionuclides. Absorbed dose to water will be measured using a planar (D400) and a segmented printed circuit board (PCB) extrapolation chamber. A pure alpha emitter such as $^{210}$Po will be initially used to evaluate the ECs before establishing traceability for clinically-relevant alpha sources such as $^{223}$Ra or $^{225}$Ac.

Figure: PCB-based EC (left) versus D400 EC (right)