

QUARTERLY LINEARITY  
OF  
RADIOISOTOPE DOSE CALIBRATOR

47-21163-01  
030-19861  
2011-001

MANUFACTURER: CAPINTEC MODEL #: CRC-7 SERIAL #: 71146  
RADIOACTIVE SOURCE / RADIONUCLIDE: 99mTc ☒ OTHER ☐

DATE	TIME	ELAPSED TIME	ACTUAL ACT.	CALCULATED ACT.	% DIFFERENCE
8-1-11	0830	⊙	100.0 mCi	—	—
8-1-11	1300	4 HRS 30min	59.0 mCi	59.56 mCi	< 1%
8-1-11	1600	7 HRS 30min	41.9 mCi	42.17 mCi	< 1%
8-2-11	0930	25 HRS	5.57 mCi	5.62 mCi	< 1%
8-2-11	1430	30 HRS	3.10 mCi	3.16 mCi	1.9%
8-2-11	1600	31 HRS 30min	2.63 mCi	2.66 mCi	1.1%
8-3-11	0830	48 HRS	392 uCi	398 uCi	1.5%
8-3-11	1230	52 HRS	245 uCi	251 uCi	2.4%
8-3-11	1530	55 HRS	173 uCi	178 uCi	2.8%
8-4-11	0900	72 HRS 30min	23.0 uCi	23.6 uCi	2.5%

PROCEDURE: 1. Record date and times, over an approximately 72 HR. period.

- Calculate the time elapsed from the first reading. (eg. 8am on June 1 to 15:25 on June 2 is 31 hrs. and 25 min.)
- Calculate the predicted activity by multiplying the original activity by the factor for the elapsed time, or use the equation:

$$A = A_0 (.5)^{T/T_{1/2}}$$

- Calculate the % difference by the following equation:

$$\frac{\text{Dose Calibrator Activity} - \text{Calculated Activity} \times 100 \%}{\text{Calculated Activity}} = \% \text{Diff.}$$

Example:  $\frac{12.1 \text{ mCi} - 12.6 \text{ mCi} \times 100\%}{12.6 \text{ mCi}} = 4.0 \%$

- If any of the readings are outside the +/- 5% limit, it could indicate the need for repair of the instrument or preparation of a graph of correction factors.

Linearity Check Performed By: Christa M. Obenshain

NRC-004