# Cu-67 Specification

High Specific Activity & High purity

|  |  |
| --- | --- |
| **Half Life** | 2.58 days |
| **Decays** | Zn-67 stable |
| **Significant emissions** | Beta : 580 keV Gamma : 184.6 keV |
| **Form** | CuCl2 |
| **Available** | Solution 0.01 M HCl |
| **Concentration** | 300 mCi/mL  11.1 GBq/mL |
| **Specific Activity** | > 50 Ci/mg  typically >200 Ci/mg;  1.48 - 7.40 TBq/mg |
| **Radionuclidic Purity** | >99.9% Cu-67 |
| **Calibration date** | 24 hrs from process end date |
| **Expiry date** | 10 days post- calibration date |
| **Availability** | Weekly |
| **Batch Size** | 50-200 mCi;  1.85-7.4 GBq  Available in larger batches on request |
| **Packaging** | 1ml conical screw top vial |
| **Research Grade** | Not for Human Use |

**Cu-67**



e-Linac produced Research Grade Product

## Idaho Accelerator Center



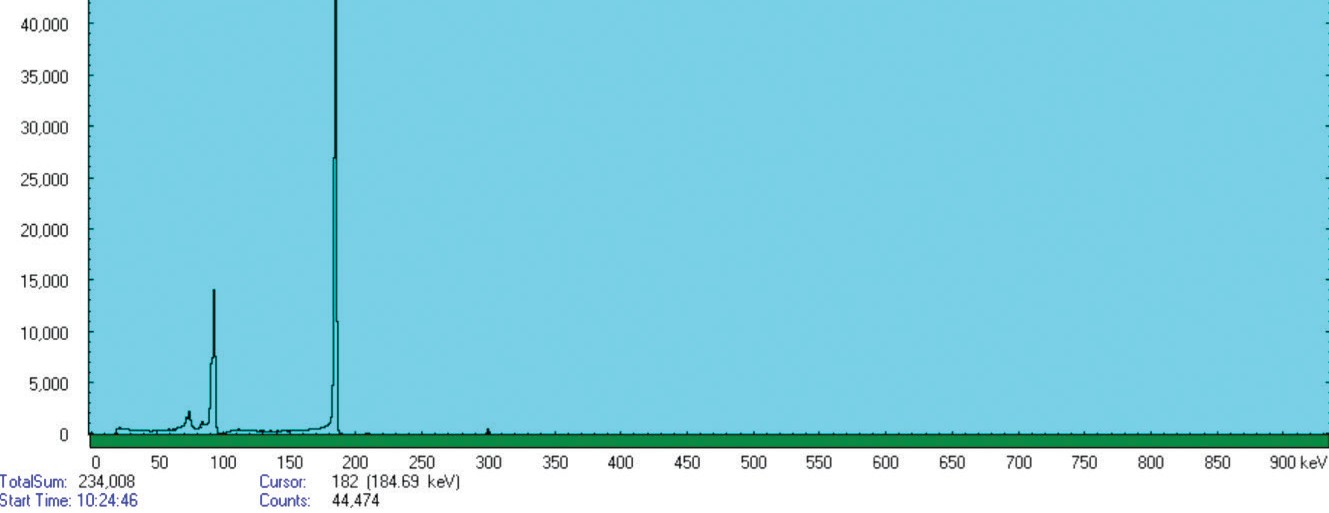
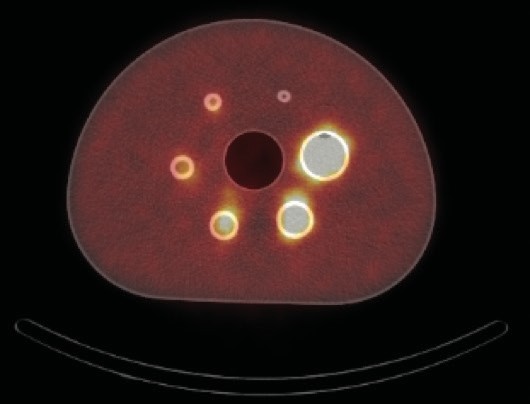
1500 Alvin Ricken Drive, Pocatello, ID 83201, USA

Contact: Jon Stoner Ph: +1 208 282 587

Email: [stonjon@isu.edu](mailto:stonjon@isu.edu)

**e-Linac Cu-67**

**Typical Gamma Spectrum of e-Linac Cu-67**



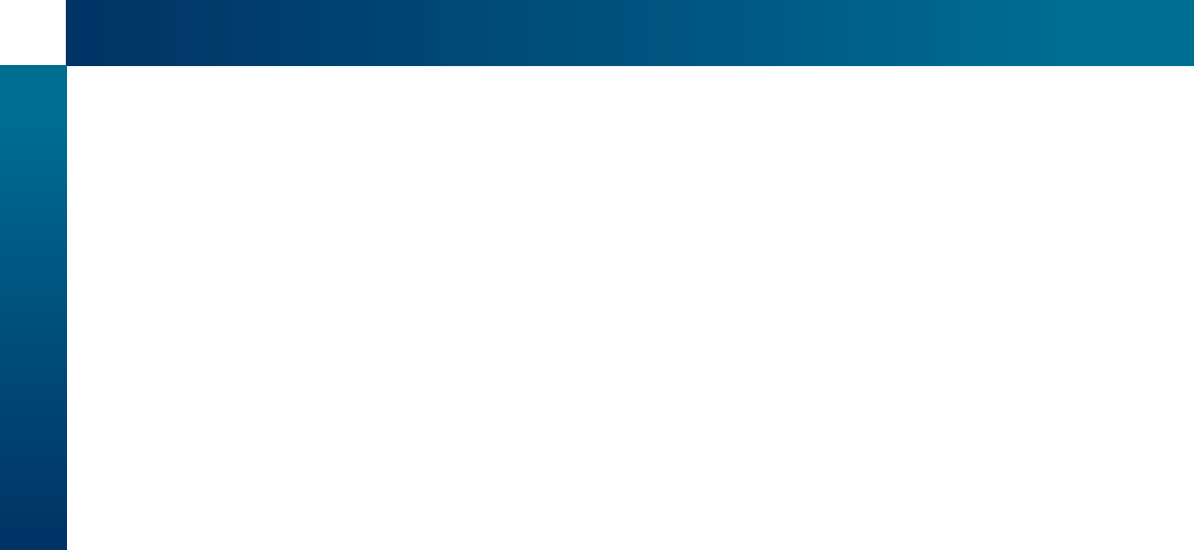
Cu-67 is an ideal radionuclide for therapy in oncology. For radiopharmaceutical devel- opment it forms the perfect ‘theranostic pairing’ with Cu-64, used for PET imaging. The gamma emissions of Cu-67 also enable surrogate SPECT imaging over 10 days.

Counts

Historically, Cu-67 has been produced on high-energy proton accelerators. Unfortu- nately, low specific activity, poor availability and co-production of Cu-64 and other ra- dionuclides have limited its widespread use.

Energy (keV)

## Percentage of e-Linac Cu-67 activity remaining after EOB

*Figure 1: SPECT CT image of Cu-67 phantom (Royal North Shore Hospital, Sydney, Australia)*

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Hours since activation** | | | | | | | | |
| **Days since activation** |  | 0 | 3 | 6 | 9 | 12 | 15 | 18 | 21 |
| 0 | 100% | 97% | 93% | 90% | 87% | 85% | 82% | 79% |
| 1 | 76% | 74% | 71% | 69% | 67% | 65% | 62% | 60% |
| 2 | 58% | 56% | 55% | 53% | 51% | 49% | 48% | 46% |
| 3 | 45% | 43% | 42% | 40% | 39% | 38% | 36% | 35% |
| 4 | 34% | 33% | 32% | 31% | 30% | 29% | 28% | 27% |
| 5 | 26% | 25% | 24% | 24% | 23% | 22% | 21% | 21% |
| 6 | 20% | 19% | 19% | 18% | 17% | 17% | 16% | 16% |
| 7 | 15% | 15% | 14% | 14% | 13% | 13% | 12% | 12% |
| 8 | 12% | 11% | 11% | 10% | 10% | 10% | 9% | 9% |
| 9 | 9% | 9% | 8% | 8% | 8% | 7% | 7% | 7% |

Today, e-linac production of Cu-67 [using the photonuclear reaction 68Zn(y,p) 67Cu] is cleaner and has a ‘game changing’ higher specific activity (50 – 100 times greater). than Cu-67 produced via other nuclear reactions and high purity (>99% radionuclidic purity).

Expiry times are also longer.