

Supporting Information

Early evaluation of copper radioisotope production at ISOLPHARM

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Numerical evaluation of the production of ^{64}Cu and ^{67}Cu with the ISOL technique

The production yields (ionization and transport corrected) for ^{64}Cu and ^{67}Cu were evaluated, according to the methods reported in the main manuscript, at two beam energies (40 and 70 MeV) and four beam intensities (5, 10, 50 and 100 μA). The full results are presented in tables S1, S2, S3 and S4.

Table S1: FLUKA calculated activities for ^{67}Cu nuclides, produced in five days of irradiation of the ZrGe target with a 40 MeV proton beam.

^{67}Cu production ($t_{1/2}$: 61,83 h)								
40 MeV								
	5 μA		10 μA		50 μA		100 μA	
Time	Activity		Activity		Activity		Activity	
[days]	[Bq]	[mCi]	[Bq]	[mCi]	[Bq]	[mCi]	[Bq]	[mCi]
0,5	9,05E+04	2,45E-03	1,81E+05	4,89E-03	9,05E+05	2,45E-02	1,81E+06	4,89E-02
1	1,70E+05	4,58E-03	3,39E+05	9,17E-03	1,70E+06	4,58E-02	3,39E+06	9,17E-02
1,5	2,39E+05	6,45E-03	4,78E+05	1,29E-02	2,39E+06	6,45E-02	4,78E+06	1,29E-01
2	2,99E+05	8,09E-03	5,98E+05	1,62E-02	2,99E+06	8,09E-02	5,98E+06	1,62E-01
3	3,98E+05	1,08E-02	7,97E+05	2,15E-02	3,98E+06	1,08E-01	7,97E+06	2,15E-01
4	4,74E+05	1,28E-02	9,48E+05	2,56E-02	4,74E+06	1,28E-01	9,48E+06	2,56E-01
5	5,32E+05	1,44E-02	1,06E+06	2,87E-02	5,32E+06	1,44E-01	1,06E+07	2,87E-01
6	5,76E+05	1,56E-02	1,15E+06	3,11E-02	5,76E+06	1,56E-01	1,15E+07	3,11E-01

Table S2: FLUKA calculated activities for ^{67}Cu nuclides, produced in five days of irradiation of the ZrGe target with a 70 MeV proton beam.

^{67}Cu production ($t_{1/2}$: 61,83 h)								
70 MeV								
	5 μA		10 μA		50 μA		100 μA	
Time	Activity		Activity		Activity		Activity	
[days]	[Bq]	[mCi]	[Bq]	[mCi]	[Bq]	[mCi]	[Bq]	[mCi]
0,5	1,06E+06	2,88E-02	2,13E+06	5,76E-02	1,06E+07	2,88E-01	2,13E+07	5,76E-01
1	2,00E+06	5,39E-02	3,99E+06	1,08E-01	2,00E+07	5,39E-01	3,99E+07	1,08E+00
1,5	2,81E+06	7,59E-02	5,62E+06	1,52E-01	2,81E+07	7,59E-01	5,62E+07	1,52E+00
2	3,52E+06	9,52E-02	7,04E+06	1,90E-01	3,52E+07	9,52E-01	7,04E+07	1,90E+00
3	4,69E+06	1,27E-01	9,37E+06	2,53E-01	4,69E+07	1,27E+00	9,37E+07	2,53E+00
4	5,58E+06	1,51E-01	1,12E+07	3,01E-01	5,58E+07	1,51E+00	1,12E+08	3,01E+00
5	6,26E+06	1,69E-01	1,25E+07	3,38E-01	6,26E+07	1,69E+00	1,25E+08	3,38E+00
6	6,78E+06	1,83E-01	1,36E+07	3,66E-01	6,78E+07	1,83E+00	1,36E+08	3,66E+00

Table S3: FLUKA calculated activities for ^{64}Cu nuclides, produced in five days of irradiation of the ZrGe target with a 40 MeV proton beam.

^{64}Cu production ($t_{1/2}$: 12,7 h)								
40 MeV								
	5 μA		10 μA		50 μA		100 μA	
Time	Activity		Activity		Activity		Activity	
[days]	[Bq]	[mCi]	[Bq]	[mCi]	[Bq]	[mCi]	[Bq]	[mCi]
0,5	1,34E+07	3,61E-04	2,67E+07	7,22E-04	1,34E+08	3,61E-03	2,67E+08	7,22E-03
1	2,03E+07	5,49E-04	4,06E+07	1,10E-03	2,03E+08	5,49E-03	4,06E+08	1,10E-02
1,5	2,39E+07	6,46E-04	4,78E+07	1,29E-03	2,39E+08	6,46E-03	4,78E+08	1,29E-02
2	2,58E+07	6,97E-04	5,15E+07	1,39E-03	2,58E+08	6,97E-03	5,15E+08	1,39E-02
3	2,73E+07	7,37E-04	5,45E+07	1,47E-03	2,73E+08	7,37E-03	5,45E+08	1,47E-02
4	2,76E+07	7,47E-04	5,53E+07	1,49E-03	2,76E+08	7,47E-03	5,53E+08	1,49E-02
5	2,78E+07	7,50E-04	5,55E+07	1,50E-03	2,78E+08	7,50E-03	5,55E+08	1,50E-02
6	2,78E+07	7,51E-04	5,56E+07	1,50E-03	2,78E+08	7,51E-03	5,56E+08	1,50E-02

Table S4: FLUKA calculated activities for ^{64}Cu nuclides, produced in five days of irradiation of the ZrGe target with a 70 MeV proton beam.

^{64}Cu production ($t_{1/2}$: 12,7 h)								
70 MeV								
	5 μA		10 μA		50 μA		100 μA	
Time	Activity		Activity		Activity		Activity	
[days]	[Bq]	[mCi]	[Bq]	[mCi]	[Bq]	[mCi]	[Bq]	[mCi]
0,5	1,19E+08	3,23E-03	2,39E+08	6,46E-03	1,19E+09	3,23E-02	2,39E+09	6,46E-02
1	1,82E+08	4,91E-03	3,63E+08	9,81E-03	1,82E+09	4,91E-02	3,63E+09	9,81E-02
1,5	2,14E+08	5,78E-03	4,28E+08	1,16E-02	2,14E+09	5,78E-02	4,28E+09	1,16E-01
2	2,31E+08	6,23E-03	4,61E+08	1,25E-02	2,31E+09	6,23E-02	4,61E+09	1,25E-01
3	2,44E+08	6,59E-03	4,88E+08	1,32E-02	2,44E+09	6,59E-02	4,88E+09	1,32E-01
4	2,47E+08	6,68E-03	4,95E+08	1,34E-02	2,47E+09	6,68E-02	4,95E+09	1,34E-01
5	2,48E+08	6,71E-03	4,97E+08	1,34E-02	2,48E+09	6,71E-02	4,97E+09	1,34E-01
6	2,49E+08	6,72E-03	4,97E+08	1,34E-02	2,49E+09	6,72E-02	4,97E+09	1,34E-01