Zarnowiec-Kopalino

Hypothesis: Reactor AP1000 (3415 MWth)

Detail of the source term

Table A.1. Source term of parent nuclides following an accident CAT BP in a nuclear reactor model AP1000 2 loops

Rare gas are not taken into account

	(Parent) nuclide	Group No	Source term Bq	Half-life T1/2 (s)
1	I-131	2	1.60E+18	6.93E+05
2	Cs-134	3	1.95E+17	6.52E+07
3	Cs-136	3	5.56E+16	1.14E+06
4	Cs-137	3	1.14E+17	9.53E+08
5	Rb-86	3	2.30E+15	1.61E+06
6	Sb-127	4	6.20E+15	3.33E+05
7	Te-127M	4	7.95E+14	9.42E+06
8	Te-129M	4	2.71E+15	2.90E+06
9	Te-132	4	8.31E+16	2.77E+05
10	Ba-140	5	2.26E+16	1.10E+06
11	Sr-89	5	1.28E+16	4.37E+06
12	Sr-90	5	1.10E+15	9.09E+08
13	Mo-99	6	3.05E+17	2.37E+05
14	Ru-103	6	2.40E+17	3.39E+06
15	Ru-106	6	7.91E+16	3.23E+07
16	Ce-141	8	2.53E+13	2.81E+06
17	Ce-144	8	1.91E+13	2.46E+07
18	Np-239	8	2.99E+14	2.04E+05
19	Pu-238	8	5.94E+10	2.77E+09
20	Pu-239	8	5.22E+09	7.61E+11
21	Pu-240	8	7.66E+09	2.07E+11
22	Pu-241	8	1.72E+12	4.53E+08
	Total source term:		2.72E+18	

Source of primary data on the source term: (Sholly et al. 2014, 31-32). Source on half-lives (EPA 2019a)

Table A.2. List of 'parent' nuclides (of the source term) and the related 'progeny' taken into account in this study

	Parent nuclide	Group No	Progeny Yield	Progeny Name	Half-life T1/2 (s)
1	I-131	2	0.0118	Xe-131m	1.02E+06
2	Cs-137	3	0.944	Ba-137m	1.53E+02
3	Sb-127	4	0.823	Te-127	3.37E+04
4	Sb-127	4	0.177	Te-127m	9.42E+06
5	Te-127M	4	0.976	Te-127	3.37E+04
6	Te-129M	4	0.63	Te-129	4.18E+03
7	Te-129M	4	0.37	I-129	4.96E+14
8	Te-132	4	1	I-132	8.26E+03
9	Ba-140	5	1	La-140	1.45E+05
10	Sr-90	5	1	Y-90	2.31E+05
11	Mo-99	6	0.123	Tc-99	6.67E+12
12	Mo-99	6	0.877	Tc-99m	2.17E+04
13	Ru-103	6	0.988	Rh-103m	3.37E+03
14	Ru-106	6	1	Rh-106	2.98E+01
15	Ce-144	8	0.99	Pr-144	1.04E+03
16	Ce-144	8	0.00977	Pr-144m	4.32E+02
17	Np-239	8	1	Pu-239	7.61E+11
18	Pu-238	8	1	U-234	7.75E+12
19	Pu-239	8	0.999	U-235m	1.56E+03
20	Pu-239	8	0.0006	U-235	2.22E+16
21	Pu-240	8	1	U-236	7.40E+14
22	Pu-241	8	1	Am-241	1.36E+10
23	Pu-241	8	0.0000245	U-237	5.83E+05

Source: (EPA 2019a, Table A-1. Nuclides of ICRP Publication 107 ordered by atomic number)