CONVERSION FACTORS FOR IONIZING RADIATION

CONVERSION BETWEEN SI AND OTHER UNITS

Quantity	Symbol for quantity	Expression in SI units	Expression in symbols for SI units	Special name for SI units	Symbols using special names	Conventional units	Symbol for conventional unit	Value of conventional unit in SI units
Activity	A	1 per second	s^{-1}	becquerel	Bq	curie	Ci	3.7×10^{10} Bq
Absorbed dose	D	joule per kilogram	J kg^{-1}	gray	Gy	rad	rad	0.01 Gy
Absorbed dose rate	$\dot{D}$	joule per kilogram second	J kg^{-1} s^{-1}		Gy s^{-1}	rad	rad s^{-1}	0.01 Gy s^{-1}
Average energy per ion pair	W	joule	J			electronvolt	eV	1.602×10^{-19} J
Dose equivalent	H	joule per kilogram	J kg^{-1}	sievert	Sv	rem	rem	0.01 Sv
Dose equivalent rate	$\dot{H}$	joule per kilogram second	J kg^{-1} s^{-1}		Sv s^{-1}	rem per second	rem s^{-1}	0.01 Sv s^{-1}
Electric current	I	ampere	A			ampere	A	1.0 A
Electric potential difference	U, V	watt per ampere	W A^{-1}	volt	V	volt	V	1.0 A
Exposure	X	coulomb per kilogram	C kg^{-1}			roentgen	R	2.58×10^{-4} C kg^{-1}
Exposure rate	$\dot{X}$	coulomb per kilogram second	C kg^{-1} s^{-1}			roentgen	R s^{-1}	2.58×10^{-4} C kg^{-1} s^{-1}
Fluence	ϕ	1 per meter squared	m^{-2}			1 per centimeter squared	cm^{-2}	1.0×10^{4} m^{-2}
Fluence rate	Φ	1 per meter squared second	m^{-2} s^{-1}			1 per centimeter squared second	cm^{-2} s^{-1}	1.0×10^{4} m^{-2} s^{-1}
Kerma	K	joule per kilogram	J kg^{-1}	gray	Gy	rad	rad	0.01 Gy
Kerma rate	$\dot{K}$	joule per kilogram second	J kg^{-1} s^{-1}		Gy s^{-1}	rad per second	rad s^{-1}	0.01 Gy s^{-1}
Lineal energy	y	joule per meter	J m^{-1}			kiloelectron volt per micrometer	keV μm^{-1}	1.602×10^{-10} J m^{-1}
Linear energy transfer	L	joule per meter	J m^{-1}			kiloelectron volt per micrometer	keV μm^{-1}	1.602×10^{-10} J m^{-1}
Mass attenuation coefficient	μ/ρ	meter squared per kilogram	m^2 kg^{-1}			centimeter squared per gram	cm^2 g^{-1}	0.1 m^2 kg^{-1}
Mass energy transfer coefficient	μ_{tr}/ρ	meter squared per kilogram	m^2 kg^{-1}			centimeter squared per gram	cm^2 g^{-1}	0.1 m^2 kg^{-1}
Mass energy absorption coefficient	μ_{en}/ρ	meter squared per kilogram	m^2 kg^{-1}			centimeter squared per gram	cm^2 g^{-1}	0.1 m^2 kg^{-1}
Mass stopping power	S/ρ	joule meter squared per kilogram	J m^2 kg^{-1}			MeV centimeter squared per gram	MeV cm^2 g^{-1}	1.602×10^{-14} J m^2 kg^{-1}
Power	P	joule per second	J s^{-1}	watt	W	watt	W	1.0 W
Pressure	p	newton per meter squared	N m^{-2}	pascal	Pa	torr	torr	(101325/760)Pa
Radiation chemical yield	G	mole per joule	mol J^{-1}			molecules per 100 electron volts	molecules $(100\ eV)^{-1}$	1.04×10^{-7} mol J^{-1}
Specific energy	z	joule per kilogram	J kg^{-1}	gray	Gy	rad	rad	0.01 Gy

CONVERSION FACTORS FOR IONIZING RADIATION (continued)

CONVERSION OF RADIOACTIVITY UNITS FROM MBq TO mCi AND μCi

MBq	mCi	MBq	mCi	MBq	μCi	MBq	μCi
7000	189.	500	13.5	30	810	1	27
6000	162.	400	10.8	20	540	0.9	24
5000	135.	300	8.1	10	270	0.8	21.6
4000	108.	200	5.4	9	240	0.7	18.9
3000	81.	100	2.7	8	220	0.6	16.2
2000	54.	90	2.4	7	189	0.5	13.5
1000	27.	80	2.16	6	162	0.4	10.8
900	24.	70	1.89	5	135	0.3	8.1
800	21.6	60	1.62	4	108	0.2	5.4
700	18.9	50	1.35	3	81	0.1	2.7
600	16.2	40	1.08	2	54		

CONVERSION OF RADIOACTIVITY UNITS FROM mCi AND μCi TO MBq

mCi	MBq	mCi	MBq	μCi	MBq	μCi	MBq
200	7400	10	370	1000	37.0	80	2.96
150	5550	9	333	900	33.3	70	2.59
100	3700	8	296	800	29.6	60	2.22
90	3330	7	259	700	25.9	50	1.85
80	2960	6	222	600	22.2	40	1.48
70	2590	5	185	500	18.5	30	1.11
60	2220	4	148	400	14.8	20	0.74
50	1850	3	111	300	11.1	10	0.37
40	1480	2	74.0	200	7.4	5	0.185
30	1110	1	37.0	100	3.7	2	0.074
20	740			90	3.33	1	0.037

CONVERSION OF RADIOACTIVITY UNITS

100 TBq (10^{14} Bq)	=	2.7 kCi (2.7×10^{3} Ci)	100 kBq (10^{5} Bq)	=	2.7 μCi (2.7×10^{-6}Ci)
10 TBq (10^{13} Bq)	=	270 Ci (2.7×10^{2} Ci)	10 kBq (10^{4} Bq)	=	270 nCi (2.7×10^{-7} Ci)
1 TBq (10^{12} Bq)	=	27 Ci (2.7×10^{1} Ci)	1 kBq (10^{3} Bq)	=	27 nCi (2.7×10^{-8} Ci)
100 GBq (10^{11} Bq)	=	2.7 Ci (2.7×10^{0} Ci)	100 Bq (10^{2} Bq)	=	2.7 nCi (2.7×10^{-9} Ci)
10 GBq (10^{10} Bq)	=	270 mCi (2.7×10^{-1} Ci)	10 Bq (10^{1} Bq)	=	270 pCi (2.7×10^{-10} Ci)
1 GBq (10^{9} Bq)	=	27 mCi (2.7×10^{-2} Ci)	1 Bq (10^{0} Bq)	=	27 pCi (2.7×10^{-11} Ci)
100 MBq (10^{8} Bq)	=	2.7 mCi (2.7×10^{-3} Ci)	100 mBq (10^{-1} Bq)	=	2.7 pCi (2.7×10^{-12} Ci)
10 MBq (10^{7} Bq)	=	270 μCi (2.7×10^{-4} Ci)	10 mBq (10^{-2} Bq)	=	270 fCi (2.7×10^{-13} Ci)
1 MBq (10^{6} Bq)	=	27 μCi (2.7×10^{-5} Ci)	1 mBq (10^{-3} Bq)	=	27 fCi (2.7×10^{-14} Ci)

CONVERSION OF ABSORBED DOSE UNITS

SI Units		Conventional
100 Gy (10^{2} Gy)	=	10,000 rad (10^{4} rad)
10 Gy (10^{1} Gy)	=	1,000 rad (10^{3} rad)
1 Gy (10^{0} Gy)	=	100 rad (10^{2} rad)
100 mGy (10^{-1} Gy)	=	10 rad (10^{1} rad)
10 mGy (10^{-2} Gy)	=	1 rad (10^{0} rad)
1 mGy (10^{-3} Gy)	=	100 mrad (10^{-1} rad)
100 μGy (10^{-4} Gy)	=	10 mrad (10^{-2} rad)
10 μGy (10^{-5} Gy)	=	1 mrad (10^{-3} rad)
1 μGy (10^{-6} Gy)	=	100 μrad (10^{-4} rad)
100 nGy (10^{-7} Gy)	=	10 μrad (10^{-5} rad)
10 nGy (10^{-8} Gy)	=	1 μrad (10^{-6} rad)
1 nGy (10^{-9} Gy)	=	100 nrad (10^{-7} rad)

CONVERSION OF DOSE EQUIVALENT UNITS

100 Sv (10^{2} Sv)	=	10,000 rem (10^{4} rem)
10 Sv (10^{1} Sv)	=	1,000 rem (10^{3} rem)
1 Sv (10^{0} Sv)	=	100 rem (10^{2} rem)
100 mSv (10^{-1} Sv)	=	10 rem (10^{1} rem)
10 mSv (10^{-2} Sv)	=	1 rem (10^{0} rem)
1 mSv (10^{-3} Sv)	=	100 mrem (10^{-1} rem)
100 μSv (10^{-4} Sv)	=	10 mrem (10^{-2} rem)
10 μSv (10^{-5} Sv)	=	1 mrem (10^{-3} rem)
1 μSv (10^{-6} Sv)	=	100 μrem (10^{-4} rem)
100 nSv (10^{-7} Sv)	=	10 μrem (10^{-5} rem)
10 nSv (10^{-8} Sv)	=	1 μrem (10^{-6} rem)
1 nSv (10^{-9} Sv)	=	100 nrem (10^{-7} rem)